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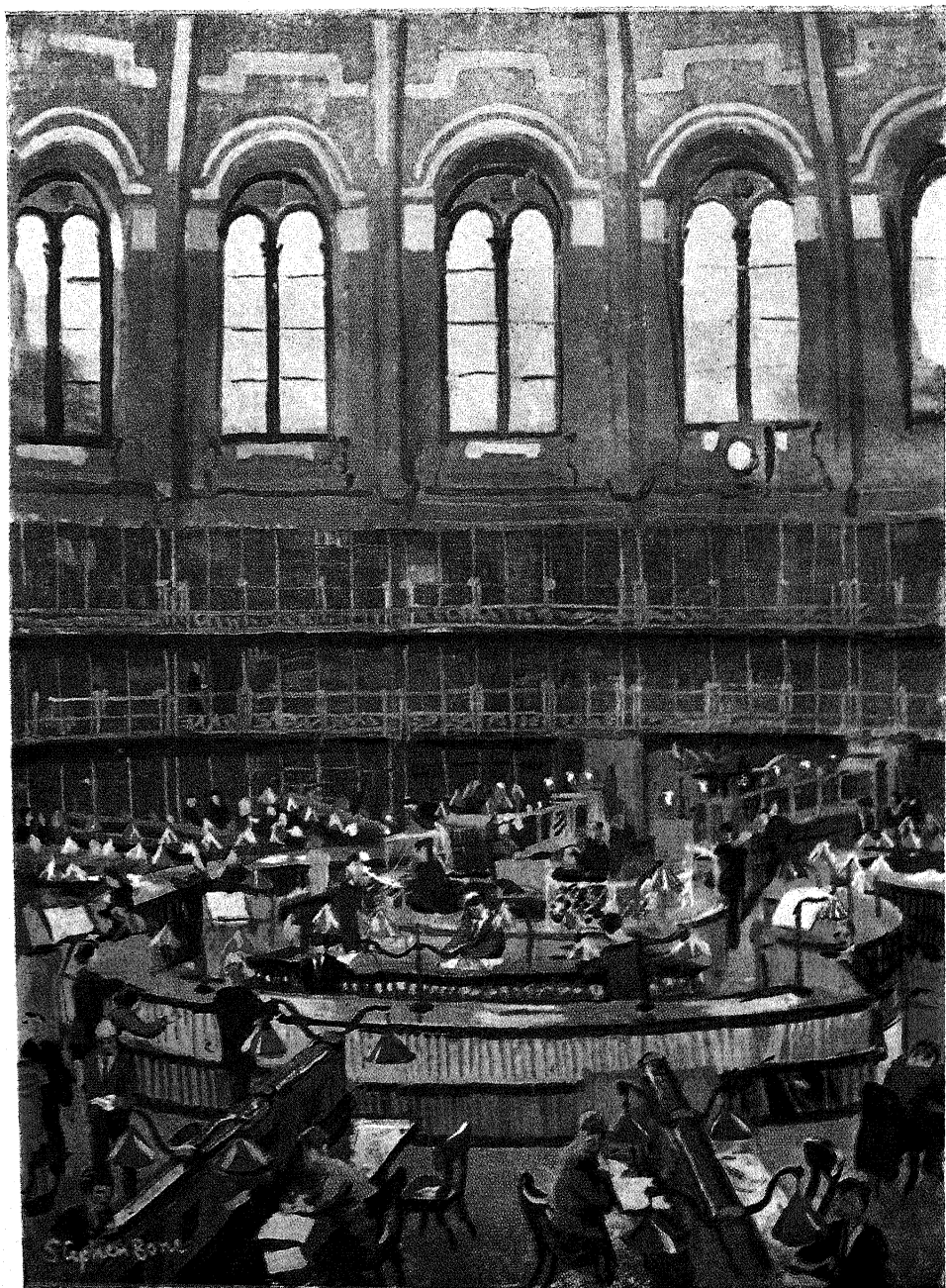
The New
UNIVERSAL
Encyclopedia



Volume 10

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The New UNIVERSAL Encyclopedia

Edited by

Sir John Hammerton

*Editor of The Universal History of the World,
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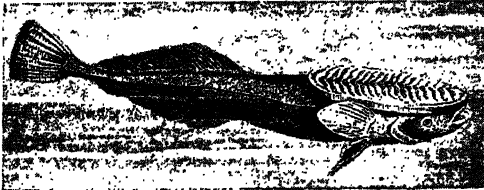
SUCH—ZYWI



London : The Educational Book Co., Ltd.

Suchau OR SOOCHOW. Town of China, the provincial capital of Kiang-su prov. It is situated 54 m. N.W. of Shanghai, with which it is connected by the Shanghai-Nanking rly. and by the Suchau Creek. An important centre of the silk industry, Suchau, on the Grand Canal, is one of the famous cities of China. Its walls are about 30 ft. in height and have a circuit of some 12 m. Without the walls are extensive suburbs, some of which reach as far as the shores of Tai Lake, one of the beauty spots of China. Numerous canals wind through the city, and form the heart of a network of waterways which serve the neighbourhood. Minor industries include the production of carved wares, metal goods, lacquer, and glass. Suchau suffered severely at the hands of the Taipings. It was opened to foreign trade in 1896. Pop. 260,000.

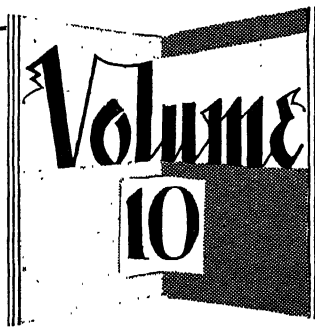
Suchet, Louis Gabriel (1770-1826). French soldier. Born March 2, 1770, the son of a silk merchant at Lyons, he became a soldier on the outbreak of the Revolution. He saw a good deal of service in Italy and elsewhere, and in 1799 was in command of a division, distinguishing himself in the campaign against the Austrians in



Sucking Fish. *Naucrates ductor*, a species of Remora, showing the sucking disk upon its head

Italy. He took part in the campaign of 1805 against Austria and of 1806-07 against Prussia, and was afterwards in Spain, where he had other successes, one being a victory over the British at Sagunto in 1812. Having joined the Bourbons in 1814, he returned to Napoleon during the Hundred Days and was exiled. Returning to France in 1819, he died Jan. 3, 1826. Suchet was made a marshal and duke of Valencia, a province he conquered. He married a lady who was related to Joseph Bonaparte, and left memoirs, parts of which have been published.

Suck. River of Eire, in Connacht prov. It rises in Lough O'Flynn, in the W. of Roscommon, and flows 60 m. S. and S.E. between that county and Galway to the Shannon at Shannonbridge, 8 m. below Ballinasloe.



Sucker. In gardening, term applied to a shoot making growth from the root or ground level of a shrub or tree. Removed in autumn, and replanted, they form a valuable means for increasing stock. See Gardening.

Sucking Fish OR REMORA. Name popularly applied to several groups of fishes distinguished by the presence of a disk on the upper part of the head, or on the breast, which acts as a sucker and enables the animal to attach itself to any object. They attach themselves to moving objects, such as ships, sharks, and turtles, as well as stones. The back of the remora is light coloured and the underside dark—an aid to concealment when attached by the back of the head to a dark object. See Lumpsucker.

Suckling, Sir JOHN (1609-42). English poet. Son of Sir John Suckling, comptroller of the household to James I, he was born at Whitton, Middlesex, and educated at Trinity College, Cam-

bridge. He was admitted to Gray's Inn, and after inheriting large estates travelled in France and Italy, and served under Gustavus Adolphus. Knighted in 1630, he became conspicuous at court for his wit, prodigality, and addiction to gaming. He raised a troop of horse to aid Charles I against the Scots, and was M.P. for Bramber. Implicated in a Royalist army plot, he escaped to Paris, where he is said to have committed suicide. He wrote a few plays, some happy descriptions of his contemporaries in *The Session of the Poets*, 1637, and a book on Socinianism, but is best remem-

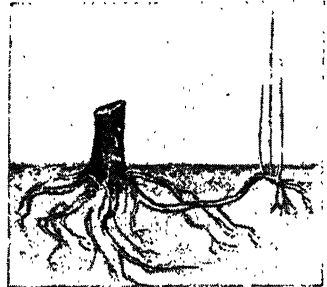


Sir John Suckling, English poet

bered by some lyrics, including *Why so pale and wan, fond lover?*; *When, dearest, I but think of thee*; and *Ballad upon a Wedding*. He is believed to have invented cribbage. He appears in Rose Macaulay's novel, *They Were Defeated*.

Sucre. Small state of Venezuela. Situated on the Caribbean Sea and the Gulf of Paria; the interior is mountainous. Cumana is the capital. It has an area of 4,554 sq. m. Pop. 291,452. Pron. Sookray.

Sucre. Official capital of the republic of Bolivia, formerly called Chuquisaca. It is situated at an alt. of 8,532 ft. on a plateau of the E. Cordillera of the Andes, 45 m. N.E. of Potosí (with which it is con-



Sucker. Diagram illustrating the growth of suckers from the lateral roots of a tree

nected by rly. and road) and 318 m. S.E. of La Paz. Here is the national supreme court. The cathedral (begun 1553), the president's palace, and the university, by repute the oldest in S. America, are the main buildings. Agriculture is the principal industry and mining is also carried on. Founded by Spaniards in 1538, it was originally called Ciudad de la Plata, from the rich silver mines in the neighbourhood. Here Bolivian independence was proclaimed in 1825, and the city took its modern name from the first president of the republic. During the civil wars, though Sucre remained the capital, the sessions of congress were often held at La Paz. Pop. 30,000.

Suction Force. Botanical term. It is applied to the difference between the osmotic pressure of the cell-sap, which tends to cause water to pass into the cell, and the elastic recoil of the wall, which tends to force water out. At one time it was considered an adequate explanation of movement of water into cells, but it is probably assisted by some special secretory activity of the protoplasm.

Suction Gas. Term used for gas used in suction as distinct from direct pressure. It does not in-

dicate any particular kind or quality of gas, but refers only to the manner in which the gas is produced and used.

During the development of the special furnaces or producers and of the gas engine itself, the idea of allowing the gas engine to draw its supply of gas from the producer, that is to say, to suck the gas into its cylinder as required, was evolved. Gas so provided became known as suction gas, as distinguished from gas supplied under pressure.

Sudan or **SOUDAN**, **THE** (Arabic Beled-es-Sudan, land of the Blacks). Region of N. Africa. It stretches from the Atlantic to the Red Sea and the highlands of Abyssinia, and from the Sahara and Egypt in the N. to the central equatorial regions. A dist. of no definite boundaries, but rather a loose geographical expression, the Sudan is divided into three portions—the Western Sudan, containing the basins of the rivers draining into the Atlantic; the Central Sudan, containing the rivers draining into Lake Chad; and the Anglo-Egyptian Sudan. Most of Western and Central Sudan is French territory. Over much of the Sudan the mean monthly temp. exceeds 80° F. in the hot season. At Khartum, in the Anglo-Egyptian Sudan (*q.v.*), the rainfall is 5 ins.; at Lokoja in Nigeria, at the junction of the Niger and the Benue, 50 ins. is recorded between April and Oct.

FRENCH SUDAN. The colony of Upper Senegal-Niger was created in 1904 out of the former territories of Senegambia and Niger, less the Senegal protectorate, which was restored to Senegal. The name of this colony was changed to French Sudan, Dec. 4, 1920. One of the eight territories of French West Africa, it is 479,783 sq. m. in area, with a pop. (1946) of 3,812,000. Many of the inhabitants are nomads whose wealth consists of cattle, horses, asses, sheep and goats, and camels. Settled peoples grow millet, rice, maize, ground nuts, and cotton; the Sansanding barrage is the centre of big irrigation works in the Segon and Mopti dists. on the river Niger. Imports include cotton goods, foodstuffs, motor cars, petrol, sugar, salt, and beer; chief exports are ground nuts, millet, gum, kopak, sisal, cattle and cattle products.

French Sudan is administered by a governor assisted by a privy council and a general council of 50 members (20 French, 30 African). The capital is Bamako (70,492).

A rly. 760 m. long runs from Kulikoro via Bamako and Kayes to the coast at Dakar. Small steamboats ply in the Upper Niger for about seven months in the year from Kulikoro to Timbuktu and Gao-Gao, and from Bamako to Kuru. There is air connexion with Dakar and Brazzaville. *See* West Africa, French.

Sudbury. Mun. borough and market town of Suffolk, England. It stands on the Stour, 59 m. N.E.



Sudbury arms

of London and on the Essex border, with a station on British Rlys. The chief buildings are three old churches, all Perpendicular in style—S. Peter's, S. Gregory's, and All Saints—a grammar school of the 15th century, and the town hall. Moor Hall is one of several old houses. There are manufactures of matting, flour, malt, bricks, etc. Slight remains exist of a monastery of the Dominicans. In the 14th century the Flemings introduced the manufacture of woollens. In 1271 it received a charter, in 1554 a royal charter, and elected 2 M.P.s 1558–1844. Sudbury and Woodbridge is the name of a co. constituency. Market day, Thurs. Gainsborough was born here. Pop. 7,007.

Sudbury. Part of the Middlesex borough of Wembley (*q.v.*), which embraced the older village that gave its name to the district.

Sudbury. Town and county of Ontario, Canada. The town, which lies 260 m. N.N.W. of Toronto, has stations on the C.N.R. and C.P.R. Pop. 32,203. It is the centre of the greatest nickel-producing district in the world, yielding 80 p.c. of the entire supply. *See* Nickel.

Sudd or **SADD** (Arab., to dam). Accumulation of vegetable matter which chokes the channel of the Upper Nile. The sudd is sometimes 20 ft. thick and in parts solid enough to bear the weight of elephants. The channel is kept open.

Sudermann, HERMANN (1857–1928). German dramatist and novelist. Born in East Prussia, Sept. 30, 1857, he studied at Königsberg and Berlin. Success and

fame came in 1888 with his first play, *Die Ehre*, which was followed the same year by a brilliant novel, *Franz Sörge* (Eng. trans. Dame Clare, 1892). This reached its 125th edition in 1912. Sudermann produced a succession of realistic plays and novels, often satirical and always powerful and showing great dramatic tension. His principal dramas are *Sodom's Ende*, 1890; *Haimat*, 1893 (Eng. trans. Magda, 1895); *Es Lebe das Leben*, 1902 (Eng. trans. The Joy of Living); *Der Bettler von Syrakus*, 1911; *Der Tolle Professor*, 1926. His collected stories appeared in 1919, and *Book of My Youth*, in English, in 1924. He died Nov. 21, 1928.

Sudetenland. Name of an area of Czecho-Slovakia lying to the S.E. of the Erzgebirge. Formerly part of the crown lands of the Austro-Hungarian empire, it produces coal, and has wool, cotton, linen, glass, and porcelain industries. Before the Second Great War a majority of its inhabitants were of German stock and retained their



Sudbury, Suffolk. The Perpendicular style parish church of S. Gregory

German speech, though most of them belonged to families settled for generations in the district. Their alleged oppression by the Czecho-Slovak govt. was the excuse used by Hitler for fomenting anti govt. disturbances among them, which led eventually to the German annexation of Czecho-Slovakia, 1939. In accordance with the Potsdam agreement, 1945, most Sudeten Germans were expelled from Czecho-Slovakia during 1945–46, 1,415,000 to the U.S. zone of Germany, 750,000 to the Russian; 311,000 were allowed to remain, among them industrial workers, miners, partners in mixed marriages, persons with anti-Fascist records, and the old and infirm. The expulsion was perhaps politically inevitable; but the number expelled constituted more than a seventh of Czecho-

Slovakia's pre-war pop., and among them were many highly skilled workers whose loss had a serious effect on Czech post-war recovery. See *Czecho-Slovakia*; Henlein, Konrad; Munich Crisis.

Sudeten Mountains. Mt. range of Central Europe. Part of the boundary of the Bohemian plateau, it slopes on the N.E. towards Silesia. Both the Elbe and Oder rise on the S. side and curve round it, the Oder to receive many affluents from the Silesian slopes. The highest points are Schneekoppe, 5,258 ft., Brunnenberg, 5,120 ft., and Hohe Rad, 4,950 ft. See *Riesengebirge*.

Sudra. Fourth or servile class in ancient Hindu society. Described in the Rig Veda as sprung from the feet of Purusha, it was recruited from the indigenous peoples subjugated by Aryan immigration. Menial tasks, such as lower forms of handwork and tillage, became their portion. See *Caste*.

Sue, MARIE JOSEPH EUGÈNE (1804-57). French novelist. Born in Paris, Dec. 10, 1804, he served



Eugène Sue

as a military and naval surgeon, being in Spain in 1823, and at Navarino, 1827. He came into prominence as a writer for *Emile de Gerardin's* paper, *La Presse*. In 1842 his best-known work, *Les Mystères de Paris*, depicting vice and low life and indicting civilization as an agency for driving the innocent into crime and immorality, appeared as a feuilleton in the *Journal des Débats*. Its successor, *Le Juif Errant*, 1845, was an attack on the Jesuits; *Les Mystères du Peuple*, 1849, was condemned as seditious. Deputy for the Seine in 1850, Sue became a political exile in 1851, and died Aug. 3, 1857.

Sueca. Town of Spain, in the prov. of Valencia. It stands on the left bank of the Júcar, 23 m. S. of Valencia city, and separated from the Mediterranean Sea by the Sierra de Cullera. The neighbouring valley lands are fertile and there is a trade in cereals and fruit. Pop. 19,000.

Suetonius (70-140). Roman writer, whose full name was Gaius Suetonius Tranquillus. As private secretary to the emperor Hadrian, he was able to accumulate the material for his *Lives of the Twelve*

Caesars, published in 120, the only one of his voluminous writings which has survived otherwise than in fragments. These biographies do not rank high as literature, but are a mine of information about the emperors of the 1st century A.D.

Suez. Town of Egypt. It is situated at the S. end of the Suez Canal and on the Gulf of Suez, and gives its name to an administrative area. In the neighbourhood are the Wells of Moses, on the E. side of the gulf. Fresh water is obtained from the Nile at Cairo by the Ismailia canal. Rlys. connect the town with Cairo, Port Said, and with Port Ibrahim at the S. entrance to the Canal. Pop. 108,250.

Suez. Gulf of the Red Sea. It lies between the Sinai peninsula and Egypt. It has a length of about 190 m. and an average breadth of 30 m. See *Egypt*; *Sinai*.

Suez Canal. Ship canal cut through the isthmus of Suez to connect the Mediterranean with the Red Sea. A small canal utilising intervening lakes was constructed in the time of Seti I (1380 B.C.), and is referred to in inscriptions in the temple of Karnak; it remained in use until A.D. 770. The first planning of the modern canal dates from Napoleon's expedition to Egypt, 1798. In 1846 the Société d'Études pour le Canal de Suez was founded by Prosper Enfantin, and did much preliminary work in surveying the route and geological strata. On Nov. 30, 1854, Said Pasha, viceroy of Egypt, granted to Ferdinand de Lesseps a concession for the construction of the canal, and the Compagnie Universelle du Canal Maritime de Suez was formed with a capital of £8,000,000 in 400,000 shares of £20 each, but the shares were not well taken up, particularly in England, where the scheme had all along been opposed on both political and technical grounds, and the issue was saved from failure only by Said Pasha himself agreeing to take up the balance of 177,642 shares of a nominal value of £3,552,840.

Work began on April 25, 1859, and, in spite of great difficulties, went on steadily till Said's death in 1863. Before many months his successor, Ismail, found himself involved in disputes with the co. as to the supply of labour, and his withdrawal of various rights or privileges conferred on the co. by his predecessor. He agreed to refer all outstanding questions between him and the co. to the emperor Napoleon III.

The result was that the govt. of Egypt was, in 1864, condemned to pay a total sum of £3,360,000. The canal was opened on Nov. 17, 1869. Total expenditure of the co. is said to have been about £17,000,000, but the result of the first year's working was unsatisfactory. A new loan of £800,000 was urgently required, and to raise funds the dues on shipping were increased by adopting an excessive scale of tonnage measurement, which soon led to litigation. In the end a conference was called at Constantinople on Oct. 6, 1873, at which a temporary surtax of 4 frs. per ton was granted to the co. In 1875 Ismail Pasha sold his shares to the British govt. for £4,000,000, and in 1876 three British directors joined the board that administered the canal.

In 1883 a proposal was made for duplicating the canal, but the scheme fell through, and was replaced by an alternative plan for deepening and widening the original channel. This was duly carried through at a cost which required the raising of a new loan of £4,000,000 sterling. By 1948 the total cost of the canal had reached £29,725,000.

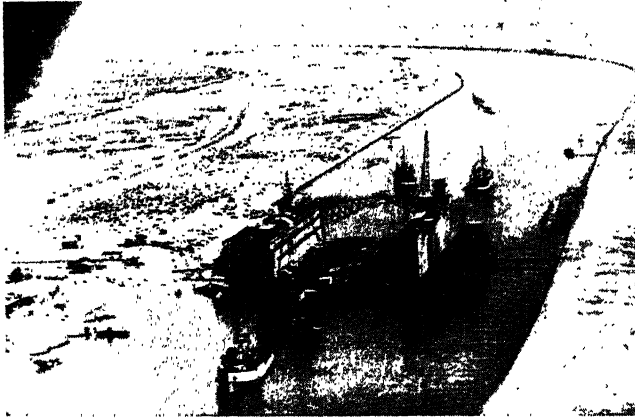
The concession for the canal was for 99 years from its completion; in 1968 it becomes the property of the Egyptian govt.

In 1926 a new town was completed on the Asiatic side of the canal and named Port Fuad, after the then king of Egypt. A swing bridge completed in 1940 crosses the canal to connect Cairo by rail with Beirut, Syria.

The length of the canal is 103 m., including approach channels; 21 m. are in Lakes Balah and



Suez Canal. Map showing course from Port Said to Suez



Suez Canal. Air view of a stretch of the canal, through which a giant floating dock is being navigated by tugs

Timsa, and the Bitter Lakes. As the result of work done since its original construction the general depth is now about 34 ft., and the average width 197 ft. Greatly increased traffic after the Second Great War, particularly of tankers, led in 1949 to the institution of a convoy system, with two convoys daily (about six ships) each way, passing in the lakes. In 1949 also, work was begun on the construction of a $7\frac{1}{2}$ m. by-pass canal near El Balah, 30 m. S. of Port Said, and it was decided to deepen the whole canal by 20 ins. The largest vessel to navigate the canal to that date was a U.S. aircraft carrier, 890 ft. long, in 1948. Tonnages of traffic since the opening of the canal are: in 1870 (first full year of operation) 436,609; in 1880 3,000,000; in 1913 20,000,000; in 1938 34,000,000; in 1948 55,000,000. British vessels in 1948 formed 38 p.c. of the total tonnage, U.S. vessels 15 p.c. The whole canal region being entirely waterless, it is supplied by the Sweetwater canal, which follows the line of Seti's canal, running from the Nile near Cairo to Ismailia, midway along the Suez canal, branching thence to the two terminals.

The Suez canal co. is registered in Egypt, but its offices are at 1, rue d'Astorg, Paris. Management is by a council of 23 administrators, of whom in 1948 10 were British (three representing the British govt. and seven British shipping interests), 18 French, 2 Egyptian, 2 American, and 1 Netherlands. In 1949 a new agreement between the co. and the Egyptian govt. provided that Egyptian representation should be gradually increased from 2 to 7, two to replace French and one British directors as vacancies occur, and two additional to be

appointed, one in 1959 and one in 1964.

Rates of transit vary according to traffic and are fixed annually; in 1948 they were 5s. 9d. per ton for laden vessels and 2s. 10 $\frac{1}{2}$ d. for unladen. In normal years receipts average 1,500,000,000 francs, and the British holdings, increased to 295,026 shares out of a total of 652,932 and valued at £44,000,000, yield an average annual dividend of £1,400,000. Shareholders' dividends are payable in Paris, and the French govt. derives a revenue from a substantial tax on dividends. The French govt. itself is not a shareholder.

By a convention signed on Oct. 29, 1888, the Suez canal is exempted from blockade, and vessels of all nations, whether armed or not, are allowed to pass through it in peace or war. This convention permitted the use of the canal by the Russians in the Russo-Japanese war, and prevented its being closed to Italian warships and transports during the Italo-Äbyssinian war of 1935. During and after the Arab-Jewish conflict of 1948, however, the Egyptian govt. confiscated certain cargoes bound for Palestine, and in 1950 introduced regulations to prevent the passage of oil and war materials to Israel.

Suez Canal in Wartime

In both the First and Second Great Wars the canal was closed by the British govt., justifying the action on the ground that Allied control of the canal was essential to the defence of Egypt. At the outbreak of the First Great War the Egyptian govt. handed over to the British military authorities the defence and direction of the Suez canal, which became the route by which Indian, Australian, and New Zealand troops reinforced the

Allied armies in France and the Middle East. Allied warships and garrisons kept the waterway open throughout hostilities, except for a few hours on Feb. 3, 1915, when a Turkish army, after crossing the desert from Damascus, reached the banks only to be defeated.

One of the chief effects of the First Great War on the canal was to increase British influence in its control and management, and to emphasise its importance to British imperial strategy as a route to and from India and the Far East. When the British govt. declared Egypt an independent state in Feb., 1922, it reserved to itself the right to maintain troops in Egypt for the defence of the canal. In 1936 a fresh treaty was drawn up defining a canal zone in which Great Britain was authorised to retain troops and aircraft until the Egyptian army should be capable of ensuring security of the canal. In 1946 a fresh agreement provided for the complete withdrawal of the British canal zone force in 1949.

After the entry of Italy into the Second Great War in June, 1940, the Mediterranean route was closed to merchantmen 1941-43, and products of the E. Mediterranean countries passed through the Suez canal and the Red Sea and round the Cape of Good Hope to reach Britain. All reinforcements for the British forces in Egypt took the Cape route. The canal was frequently, but ineffectually, attacked by Axis aircraft. The Suez canal zone was the only part of Egypt in which British military forces remained after 1947.

Suffocation. Death from asphyxia or deprivation of air caused otherwise than by drowning or by external compression of the neck, i.e. hanging or strangulation. The commonest causes of suffocation are disease, such as obstruction of the air passages by tumours; obstruction of the larynx by foreign bodies, e.g. false teeth, food, coins; pressure on the chest, as may occur in panic-stricken crowds, or after falls of earth on men working in tunnels, sand-pits, etc.; and breathing non-respirable gases, as in mines and sewers.

Suffolk. Maritime county of England. It has a coastline on the E. coast of 62 m. and an area of 1,482 sq. m., being bounded N. by Norfolk, W. by Cambs, S. by Essex. The surface is generally level, but becomes hilly in the N.W. In the N. are Oulton Broad and other sheets of water, parts of the Broads (q.v.). The rivers

include the Waveney, Deben, Orwell, Stour, Blyth, and Lark. Agriculture is the chief industry, but fishing is also important. The county is noted for its horses (Suffolk Punches). Cereals are largely grown; sheep, cattle, and poultry are reared.

Ipswich is the county town, Lowestoft being the next important place. The boroughs also include Aldeburgh, Beccles, Bury St. Edmunds, Eye, Southwold, and Sudbury. Lowestoft, Felixstowe, and Southwold are holiday resorts. Other places are Stowmarket, Woodbridge, and Saxmundham. It has many magnificent churches of flint and stone; hence the phrase "silly Suffolk" (A.S. *selig*, holy, innocent). Along the Essex border is "Constable's country," this artist having delighted to paint the landscape near his native East Bergholt. Another artist, Gainsborough, was born at Sudbury. Suffolk is divided into two administrative counties, east and west. It is in the diocese of St. Edmundsbury and Ipswich. Five M.P.s are returned. Pop. 401,114.

Suffolk, the southern part of the old kingdom of E. Anglia, suffered from Danish inroads. Its king, S. Edmund, was martyred at Hoxne, 870. In the 14th century it became one of the richest parts of England, a centre of the weaving industry. The sea has encroached considerably.

LITERARY ASSOCIATIONS. Perhaps the writer who most fully reflects this county is Crabbe, in whose poems will be found much that is descriptive of Aldeburgh. Sapiston is the scene of Robert

Bloomfield's poem, *The Farmer's Boy*; Bloomfield was born at Honington. Borrow lived for many years in a cottage by Oulton Broad, and died there in 1881. Dickens placed some memorable scenes of *The Pickwick Papers* in Ipswich, making that town, or Sudbury, the original of Eatanswill. Edward FitzGerald's *Letters* discuss Woodbridge, his birthplace, and the neighbourhood.

Bibliography. *Victoria History of Suffolk*, ed. W. Page, 1907-11; *In the Footsteps of Borrow and FitzGerald*, M. Adams, 1914; *Suffolk Scene*, J. Tennyson, 1939.

Suffolk, EARL OF. English title borne by the families of Ufford, Pole, Brandon, Grey, and since 1603 Howard. The first earl was Robert, Lord Ufford, created in 1337. He and his son were soldiers and courtiers; when the 2nd earl died in 1382, the title became extinct. In 1385 Michael de la Pole, chancellor of England, received some of the lands of the Uffords in Suffolk and the title of earl. His descendant, William, 4th earl, was made duke in 1448 and receives a separate entry. John, the 2nd duke, married Elizabeth, sister of Edward IV. Their eldest son, John, earl of Lincoln, was killed at Stoke in 1487, and the second son, Edmund, obtained the earldom only. In 1504 he was attainted; in 1513 he was put to death.

The family of Brandon furnished three dukes, Charles (v.i.) receiving the title from Henry VIII in 1514. On the death of another Charles in 1551 the dignity was given to his brother-in-law, Henry Grey, marquess of

Dorset, only to be lost when in 1554 Grey was executed for treason. The dukedom was never revived, but in 1603 the earldom was given to Thomas, a son of Thomas Howard, 4th duke of Norfolk. He became lord high treasurer in 1614. In 1628 his younger son was made earl of Berkshire, and in 1745 the 4th earl of Berkshire inherited the earldom of Suffolk.

Charles Henry George Howard (1906-41), 20th earl of Suffolk and 13th earl of Berkshire, who succeeded to the titles in 1917, had been a seaman, Guards officer, and rancher in Australia before taking up scientific experiment. He was killed in the spring of 1941 while working at his research station in Richmond Park upon unexploded German bombs, and was posthumously awarded the George Cross. The titles of 21st earl of Suffolk and 14th earl of Berkshire fell to his son Michael (b. March 27, 1935). The family seat is Charlton Park, Malmesbury, and an eldest son is called Viscount Andover.

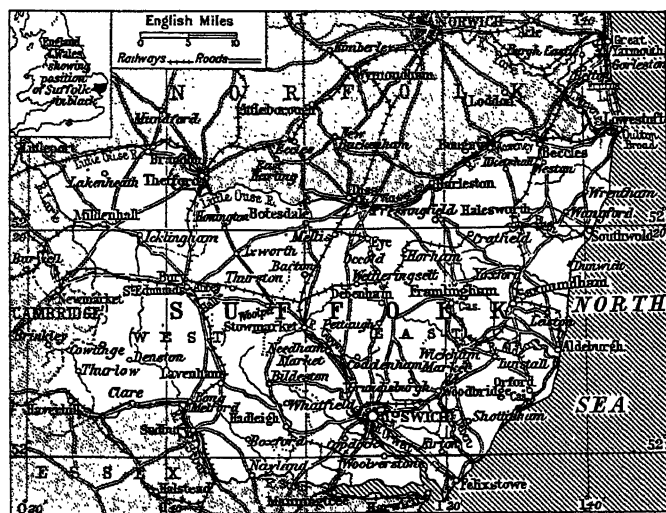
Suffolk, CHARLES BRANDON, DUKE OF (c. 1485-1545). English nobleman. A son of William Brandon, who carried Henry VII's standard at Bosworth, he first appeared as a courtier of Henry VIII. In 1513 he was marshal of the army that invaded France,



Charles Brandon,
Duke of Suffolk

and in 1514 was made duke of Suffolk. He incurred royal displeasure by his secret marriage with Henry's sister Mary, the widowed queen of France, but overcame this and was with the king at the Field of the Cloth of Gold. In 1523 he led an army in France, and he had some share in the overthrow of Wolsey. In 1536 Suffolk was sent against the rebels in the north, and he received some monastic lands. He died Aug. 24, 1545.

Suffolk, WILLIAM DE LA POLE, DUKE OF (1396-1450). English soldier and statesman. Born Oct. 16, 1396, he succeeded his brother as 4th earl of Suffolk in 1415. For some years he served in France, becoming in 1428 commander of the English. He effected a truce with France in 1444, and arranged the marriage between Henry VI and Margaret of Anjou. This policy brought him into



Suffolk. Map of this maritime county of East Anglia

conflict with Humphrey, duke of Gloucester, but the duke's death in 1447 made Suffolk more powerful than ever. When the English met with reverses in Normandy, he was charged with crimes against the state, but the king set him free on condition that he left the country, and he sailed for Calais. On May 2, 1450, he was murdered at sea. Shakespeare in King Henry the Sixth takes an unwarrantably severe view of the duke.

Suffolk Punch. Powerful breed of horse, bred in the co. of Suffolk, England, and used chiefly for agricultural purposes and as a cart-horse. See Horse colour plate.

Suffolk Regiment. Regiment of the British army. It originated in a company of pikemen formed



Suffolk Regiment badge

in 1660 for guard duties at Windsor Palace, and in 1685 formed the nucleus of a body of infantry raised by the duke of Norfolk in support of James II during the Monmouth rebellion. Taken on to the establishment in 1686 as the 12th Foot, it served under William III in Ireland, where it earned distinction at the Boyne. It fought under Marlborough in Flanders, and in 1719 was shipped as marines in Byng's fleet which defeated the Spanish off Messina. The 12th Foot fought at Dettingen and Minden. It took part in the defence of Gibraltar, 1779-83, an event commemorated by the castle and key on the regimental badge.

In 1798 the 12th Foot went to India to reap further honours at the storming of Seringapatam, 1799, and at Travancore, 1808. Honours were gained in the Kaffir War, 1851-53; the New Zealand War, 1863; the second Afghan War, 1878-80; and the Hazara campaign, 1888. From 1881 the 12th Foot was known as the Suffolk Regiment. Serving throughout the S. African War, it suffered heavy casualties in the attack on Colesberg.

Twenty-two battalions were raised for service in the First Great War and earned the honours: Le Cateau; Neuve Chapelle; Ypres, 1915, '17, '18; Somme, 1916, '18; Arras, 1917, '18; Cambrai, 1917, '18; Hindenburg Line; Macedonia, 1915; landing at Suvla; Gaza. In the Second Great War the 1st battalion formed part of the B.E.F. and of Ironside's forces 1940. The 4th

and 5th battalions were at the defence of Singapore; the 7th served with the Royal Armoured Corps in N. Africa and Italy; and the 2nd fought throughout the Burma campaign. The regimental depot is at Bury St. Edmunds.

Suffragan (late Lat. *suffraganeus*, from *suffragari*, to vote for, support). Ecclesiastical term applied to bishops. All bishops are suffragan to the archbishop of their province, but specifically suffragans are bishops consecrated to act as deputies for or assistants to a bishop in a particular part of his diocese. In the Church of England, by 26 Henry VIII, suffragan bishops might be appointed for 25 towns, but few such nominations were made until late in the 19th century. Power to increase the number of suffragans was given by the Suffragans Nomination Act, 1888. In recent years many bishops suffragan have been consecrated in various dioceses. See Bishop; Church of England; Diocese; Ecclesiastical Law.

Suffrage (Lat. *suffragari*, to vote for). The right to vote. The word has much the same significance as franchise, and the extension in Great Britain of the franchise is described under that head. On the "suffragette" movement, see Pankhurst; Women's Suffrage. See also Reform Acts; Vote.

Suffragette. Popular term in the early years of the 20th century, in England, for a female agitator for women's suffrage. The term was especially applied to the militant section of the movement, represented by the Women's Social and Political Union. See Feminism; Pankhurst; Women's Suffrage.

Sufism (Arab. *sufi*, man of wool). Form of Mahomedan mysticism. The woollen dress which occasioned the name was imitated from Christian hermits by early Muslim ascetics, who for a time observed Mahomet's prohibition of celibacy. But a Sufi monastery was founded at Ramleh before A.D. 800, and thereafter celibacy was permitted, although not enjoined.

The form of Sufism best known outside Islam was developed in Persia under Shiah influence. It was attended by a revival of Zoroastrian tenets, influenced by Vedanta, Buddhist, and Neoplatonist teaching. Thence emerged a pantheistic philosophy which taught that religious creeds are matters of indifference, that good and evil are unrealities, that there is no free will, and that mystical absorption into the divine is attainable before

death by ecstatic union. This Sufi teaching pervaded Persian poetry of the schools of Abu Said, Hafiz, Sa'di, and Rumi, met with a sympathetic reception in medieval India, and permeates the prevalent free-thought of modern Persia. See Dervish; Mahomedanism; Omar Khayyam; Persia.

Sugar. Term generally applied to the product of the sugar cane and sugar beet. Chemically the sugar from these sources is identical. In 1946-47 over 9,000,000 tons of beet sugar and nearly 19,000,000 tons of cane sugar were produced in the world.

Chemically the term is used to include the large number of carbohydrates closely related to the sugar obtained from beet and cane. They fall into four classes: Monosaccharides, e.g. glucose, $C_6H_{12}O_6$; Disaccharides, e.g. cane and beet sugars, $C_{12}H_{22}O_{11}$; Trisaccharides, e.g. raffinose, $C_{18}H_{32}O_{16}$; and Polysaccharides, e.g. starch and cellulose ($C_6H_{10}O_5$)_x. The first three classes include the sugars which have a sweet taste and are crystalline. They all contain hydrogen and oxygen in the same molecular proportions as water.

In nature sugars are formed by plants from carbon dioxide and water in the presence of chlorophyll, and are used in the vital processes including the formation of cellulose. A certain amount is converted to starch, which acts as a reserve food, being reconverted to sugar during the period of germination, when the plant is not able to synthesise sugar directly from the atmosphere.

This synthesis has not been carried out in the laboratory but the reverse process—degradation of starch and cellulose to sugars and of di- and trisaccharides to monosaccharides is easily accomplished by heating the saccharide with dilute mineral acid (hydrolysis). The number of sugars which have been chemically identified is enormous. There are about 50 known monosaccharides, of which 10 occur in nature, the rest having been synthesised in the laboratory. The structure and chemical relationships of the sugars was first worked out by Emil Fischer, and later by W. N. Haworth and his colleagues at Birmingham university; they elaborated Fischer's work and brought it into line with modern chemical theory.

Cane sugar was, until Napoleonic times, when the British blockade of the Continent led to the develop-

ment in France of the beet sugar industry, the common form used domestically. It is obtained from the sugar cane (*Saccharum officinarum*), which has been known for at least 3,000 years. The plant grows to a height of about 20 ft. It is propagated from cuttings, and the time required for maturity varies from 12 to 18 months. The sugar is stored in the soft pith, and the process of extracting consists essentially in crushing the canes, dissolving out the sugar with water, purifying the extract, and crystallising the sugar.

The chief cane sugar producing countries are, in order of importance, Cuba, India and Pakistan, Brazil, Puerto Rico, Hawaiian Is., British W. Indies, Argentina, and Australia.

The growth of sugar beet, and the process of refining sugar from it, are described under Beet Sugar.

OTHER SUGARS. Sugars are obtained from other plants, but the amount is small. The sugar maple (*Acer saccharum*) is a forest tree from the trunk of which the sugar-containing sap may be tapped by drilling small holes. The sap contains about 3 p.c. of sugar, and the yield per tree is about 2 lb. a year. As the tree takes about 20 years to reach maturity and is a valuable source of timber, it cannot compete with the annuals, beet and cane; moreover, blended syrups with a maple flavour can be produced more cheaply than the genuine article. Of the numerous species of palm, only nine produce sugar in any quantity. One of these, *Jubena chilensis*, is exploited to some extent on the W. coast of S. America. In India the natives produce sugar from species such as the palmyra, sago, and sago palm. Sorghum (*Andropogon sorghum*), a large grass, yields a syrup which is used to some extent in the U.S.A. The juice contains about 12 p.c. sugar and, when refined, about 24 p.c. crystallisable and 44 p.c. uncrystallisable sugar. Honey contains about 39 p.c. levulose, 34 p.c. dextrose, and 2 p.c. sucrose; it was used for sweetening from very early times.

Glucose or grape sugar is produced by hydrolysing corn starch by heating in dilute hydrochloric acid. The solution is neutralised, filtered, and evaporated in vacuum pans. The product—liquid glucose—contains about 35 p.c. glucose, and 48 p.c. dextrin, and is much used by bakers and confectioners.



Sugar. Four stages in the production of sugar in the W. Indies. 1. Cutting down the cane, and (2) transporting it to a mill. 3. The cane being treated at a crushing house. 4. Giant condensers in a sugar mill

For the manufacture of solid glucose, the conversion to dextrose is more complete and the solution concentrated until it solidifies on cooling. The product contains about 86 p.c. sugars of which 80 p.c. is glucose. It is yellow in colour. For medicinal purposes a glucose over 99.9 p.c. pure is prepared, which can be used among other things as a hypodermic injection when urgently necessary to restore the normal blood-sugar content.

Lactose or milk sugar is present in cows' milk (about 4 p.c.) and is extracted from the whey. It is mainly used in infants' foods, as in the body it produces galactose, a sugar essential during childhood. *Consult* Story of Sugar, G. T. Surface, 1920; Sugar, G. Fairlie, 1925.

T. Hedley Barry, F.R.I.C.

Sugarloaf. Name given to a mass of sugar that is in the form of a truncated cone. Owing to their shape, a number of mts. and hills in Europe and America are known as the Sugarloaf. Two of these are the Great and Little Sugarloaf in co. Wicklow, Eire. There is one at Rio de Janeiro and another near Folkestone. *See* Rio de Janeiro.

Suggestion (Lat. *sub*, under; *gerere*, to carry). The insinuation of a belief or impulse into the mind of another, whereby his thoughts or actions are influenced. The de-

gree of influence will depend upon the extent to which the subject's power of offering more or less resistance to the suggestion and his self-assertion are unimpaired. Such suggestions bring about a diminution of self-assertion, and lead the subject to imagine that what he says or does under the influence of suggestion is really due to his own initiative.

Whereas in normal cases improper suggestions would fail in their purpose, in abnormal cases, when the corrective factors are almost passive, it is almost necessary to adopt an attitude of command. Thus, the ordinary person, when told that a piece of black cloth is white, simply refuses to believe it; but under the influence of hypnotism he is quite ready to do so. Normal suggestion may be instanced by the conjurer's method of "forcing" a card and other tricks of his profession, the object of which is to mislead the subject. *See* Auto-suggestion; Faith Healing; Hypnotism; Psycho-analysis; Stigmata.

Suggia, GUILHERMINA (1888-1950). Portuguese 'cellist. She was born in Oporto, June 27, 1888, of Italian descent. She studied under her father, himself a notable 'cellist, and under Klengel at Leipzig, in the Gewandhaus of which city she made her début in 1905. She played in most of the great

cities of Europe, and was considered one of the finest 'cellists of her day, her interpretation of the



Madame Suggia, Portuguese 'cellist.
Portrait by Augustus John, R.A.
By courtesy of the Directors of the
Tate Gallery

Brahms double concerto for 'cello and violin being noteworthy. She died at Oporto, July 31, 1950. Her portrait by Augustus John is in the Tate Gallery, London.

Suhl. Town of Thuringia, E. Germany. Situated at a height of 1,400 ft. on the S. slopes of the Thuringian forest, it is 32 m. S.W. of Erfurt. Established as a town in the 14th cent., it has three churches of 15th, 17th, and 18th cent. origin, and a 17th cent. town hall. It was for long the home of a small arms industry, and also had factories for the making of cars, bicycles, toys, etc. It belonged to the Saxon dynasties until 1815, and then came under Prussia. After the Second Great War it was in the Russian zone of occupation. Pop. 24,000.

Sui OR HSUGHAD. Town in Szechwan prov., China. It is situated at the junction of the Min-kiang and Yang-tse rivers, 1,650 m. from the mouth of the latter. The walls were built about 1380, but the town dates back to the 6th century. Sui carries on an important trade with Yunnan, and is the centre of the white-wax industry. Pop. 119,818.

Suicide (Lat. *sui*, of one's self; *cedere*, to slay). Intentional self-slaughter. Suicide has not always been considered a disgrace. Among the Greeks and the Romans it was held in certain circumstances to be justifiable. Zeno, Eratosthenes, Cato, and Seneca are on the roll of distinguished men among the ancients who took their own lives. Demosthenes, Mithradates, Hannibal, and Brutus committed suicide to avoid capture by a foe.

With the establishment of Christianity suicide came to be looked upon with abhorrence.

The Samurai of old Japan held it noble to commit suicide in order to expiate a crime, avoid falling into the hands of the enemy, or to demonstrate their loyalty; and suicides of unsuccessful Japanese commanders during the Second Great War were not uncommon. The honour in which suicide is held by the Japanese was demonstrated also by the strength of the Kamikaze corps of suicide pilots who attacked Allied shipping in the last stages of that war in the Pacific. Fanatical suicide from religious motives was exhibited until comparatively recent times in certain Indian sects, and the British govt. in India had difficulty in stopping the voluntary death of wives on the funeral pyre of their husbands (see *Sati*).

In England suicide is a crime. Legally there is no distinction between suicide and *felo-de-se* (murder of one's self). Coroners, however, usually apply the term suicide to self-destruction during insanity, and *felo-de-se* to the taking of his life by a sane person. Suicide formerly involved escheat of the deceased's property to the crown. This penalty was finally abolished in 1870, but long before that date it had ceased to be enforced. It was also the custom, last observed in 1823, to bury the body at crossroads with a stake through it. The R.C. and Anglican Churches refuse Christian burial in cases of *felo-de-se*.

A large proportion of suicides are mentally unsound. Melancholia, alcoholic insanity, and profound neurasthenia are among the causes. In 1945 there were recorded 3,670 deaths from suicide in England and Wales. As a rule the tendency to suicide increases with age. It is most common among the educated classes, in highly civilized countries, and is steadily increasing in Europe and America. See *Hara-Kiri*.

Sui juris (Lat., of his own right). Legal term for a person who is of full legal capacity. Thus a minor is not *sui juris*, nor is a lunatic.

Suint. Compounds of potash on the fleeces of sheep, derived from sweat. In some continental countries the washings from wool are used as a source of potash, being either allowed to soak into the land or collected and evaporated.

Suippe. River of France. Chiefly in the dept. of Marne, it rises in Champagne near Suippes and flows N.W. to join the Aisne 3½ m. S.W. of Neufchâtel.

Suir. River of Eire. It rises in the N. of Tipperary and flows S. past Thurles and Caher to the border of Waterford, where it turns due N. A few miles down it changes its course to E., flows past Clonmel and Carrick-on-Suir, and unites with the Barrow in Waterford Harbour. It forms the N. and part of the W. boundary of Waterford, is 85 m. long, and navigable for barges to Clonmel. It has a salmon fishery. *Pron.* Shure.

Suite (Lat. *sequi*, to follow). Train of followers or attendants. It is also used for a set of rooms which are complementary, and for pieces of furniture made on the same principle.

In music a suite is a set of instrumental compositions grouped as one work. The practice of thus bringing together pieces of contrasted character conceived in dance forms is of very early origin. By the beginning of the 17th century these were almost invariably the moderately fast allemande, the quick courante, the dignified sarabande, and, to wind up with, the lively gigue; but often there was a prelude, praeambulum, overture, or toccata to begin with, while a gavotte, bourrée, minuet, or loupé might also be introduced. All the movements were in the same key. The suite represents the contrapuntal style in dance forms at its best, as seen in the English suites of Bach. In addition to Bach, Purcell, Couperin, and Handel were notable composers of suites.

The term suite is used by modern composers to denote a collection of pieces for divers instruments, or for orchestra, having the same key for the first and last, as a rule, and with varied tonalities for the intermediate movements. See *Harmony*; *Music*.

Suiyuan. Inner Mongolian province in N. China. It contains 18 counties and two administrative bureaux, with Kweisui as its capital. Other important cities are Paotow, terminus of the Peking-Suiyuan railway, Wuyuan, Liangcheng, and Tsining. Highways connect the province with towns in Sinkiang and other N.W. provinces. Farming is mainly confined to the central area where canals connect it with the Yellow river. Main products are wheat, livestock, and coal. The inhabitants are mostly nomad agriculturists and belong to Mongolian banners (clans). Area, 134,181 sq. m. Pop. 2,084,000.

Suk. Nilotic negro tribe in the N. half of Naivasha prov., Kenya Colony. They occupy the up-

lands W. of the Kerio valley and the plains between Lakes Baringo and Rudolf, are agricultural in the hills and pastoral in the plains. They are roundish-headed, and averaging 5 ft. 6 ins. in height.

Suk, JOSEF (1874-1935). Czech composer. Born at Krecovice, Jan. 4, 1874, he studied with Dvorak in Prague, and his work shows the influence of that composer. In 1898 he married Dvorak's daughter. He became professor of composition at the Prague conservatoire in 1922, and was director during 1924-26. He wrote extensively for strings, much of his music being influenced by personal experiences, especially the death of his wife in 1905, whom he commemorated for his son in piano pieces entitled *About Mother*. Other works included the symphonic poems *Prague*, *A Summer Tale*, and *Maturity*, *Serenade* and *Meditation* on a Chorale for string orchestra, chamber music, and songs. He died May 29, 1935.

Sukarno OR SOEKARNO, ACHMED. Indonesian statesman. See Sukarno in N.V.

Sukhum OR SUKHUMI. Capital of Abkhazia A.S.S.R., in Georgia S.S.R. It is on the Black Sea coast, 120 m. N.W. of Batum. A centre of trade in cereals, fruit, wine, tobacco, and honey, it has rly. connexion with Tuapse.

Sukkur. Dist. and town of Pakistan, in Sind. The dist. lies in the N. of Sind, mainly E. of the Indus. Native food grains, rice, and pulses are produced. Area, 5,550 sq. m. Pop. 692,556. The town is on the right bank of the Indus, where it is crossed by the great Lansdowne road and rly. bridge (1889) on the strategic rly. to Baluchistan. It has rly. carriage and wagon works and is a port for considerable river traffic. Pop. 86,466. The Lloyd Barrage (*q.v.*) lies 2 m. W.

Sulaiman Hills. Range of mts. in Pakistan, separating Baluchistan from Punjab. It presents a steep scarp to the valley of the Indus and an easier slope to the plateau which extends W. into Persia. The highest point, the Kaisargarh, reaches 11,295 ft. Fort Monro is a station at 6,300 ft.

Suleiman. Popular alternative spelling of the Arabio-Turkish name Solyman (*q.v.*).

Sulgrave. Village of Northants, England. It is $2\frac{1}{2}$ m. N.W. of Helradon, and is interesting for its connexion with the Washington family, some of whom are buried in the church of S. James. Pop. 364.

Sulgrave Manor, the ancestral home of the Washington family, was purchased in 1539 by Lawrence Washington, ancestor of George Washington, and remained the family home until 1610. In commemoration of the centenary of the peace of Ghent, the manor house, at that time a farm house, was presented to the Sulgrave Institute, which opened it as a Washington museum, 1914. Over the doorway are the Washington arms.

Sulimov. Capital of Cherkess prov., R.S.F.S.R. It is an agricultural centre, and was the centre of heavy fighting during Aug., 1942, when the Germans were advancing towards the Caucasian oilfields. It was recovered by the Russians during Jan., 1943.

Sulina. Seaport of Rumania. It is built on piles at the mouth of the Sulina arm of the Danube, and has a good fairway opening out into the Black Sea. It is about 120 m. N.E. of Constanta, with which it shares the export grain trade of Rumania. Pop. est. 6,000.

Sulla, LUCIUS CORNELIUS (138-78 B.C.). Roman soldier and statesman. Of noble birth, he served



Lucius Sulla,
Roman soldier
Vatican Museum

brilliantly under Marius (*q.v.*) in the war against Jugurtha, 107 B.C. He won fresh distinction in the war with the Teutones, 104-101. Having excited the jealousy of Marius, he became marked out for the leadership of the aristocratic party.

In the Social War Sulla achieved the most brilliant successes. Then Mithradates, king of Pontus, challenged Rome; the command of the eastern armies was given to Sulla, but when superseded by Marius, he drove him from Rome, 88, and departed to deal with Mithradates.

Defeating him in 84, he returned to Italy, where the Democrats had effected a revolution.

After winning the decisive battle of the Colline Gate before the walls of Rome, in 82 Sulla was appointed dictator, proscribed the Marians, and revolutionised the constitution; he made the senate supreme, reformed the judiciary and executive, but placed no checks on aspirants to military dictatorship. Established at an unparalleled height of power, Sulla resigned all his offices in 79 and retired to his estate to indulge in the debaucheries of which he died. Intellectually above any of his contemporaries, Sulla was a master of war and statecraft, steeped in culture, perfectly self-reliant but absolutely devoid of morality. *Consult* History of Rome, T. Mommsen, new ed. 1901; *Outlines of Roman History*, H. F. Pelham, 5th ed. 1909.

Sullivan, SIR ARTHUR SEYMOUR (1842-1900). British composer. Born in London, May 13, 1842, he

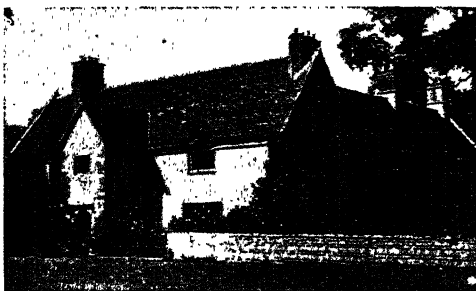


Arthur Sullivan

entered the Chapel Royal choir in 1854, studied at the Royal Academy of Music and at Leipzig, 1857-61, and first attracted attention by his cantata, *Kenilworth*, 1864. Sullivan is best known by his musical collaboration with Sir W. S. Gilbert in their famous series of light operas. *Thespis*, 1871, was their first joint work, their partnership concluding with *The Grand Duke*, 1896.

Sullivan's dramatic works composed with other librettists include *Cox and Box*, 1867, *Haddon Hall*, 1892, *The Beauty Stone*, 1898, and *The Rose of Persia*, 1900. The perfect blend of Sullivan's melodic gift with Gilbert's genius gave him

lasting fame, but his other compositions were also distinguished. He wrote oratorios, *The Light of the World*, 1873, and *The Golden Legend*, 1886, a grand opera, *Ivanhoe*, 1891, incidental music for several Shakespearean plays, and church music; some of his separate songs, e.g. *The Lost*



Sulgrave, Northamptonshire. The old manor house, formerly occupied by the Washington family, now a museum of relics

Chord, 1877, enjoyed great popularity. Knighted in 1883, he died in London, Nov. 22, 1900. See Gilbert and Sullivan. *Consult* Life, Letters, and Diaries, H. Sullivan and N. Flower, 1935.

Sullivan, BARRY (1821-91). Irish actor. Born at Birmingham, July 5, 1821, he made his début



Barry Sullivan,
Irish actor

at Cork in 1840, and first appeared in London at the Haymarket Theatre, Feb. 7, 1852, as Hamlet. He toured America, and for six years was an actor-manager in Australia. Afterwards, he played many Shakespearian and modern parts in London, managed the Holborn Theatre, 1868-70, and starred at Drury Lane. He died May 3, 1891.

Sullivan, FRANCIS L. (b. 1903). British actor. Born in London, Jan. 6, 1903, he was educated in Switzerland, and made his first stage appearance at the Old Vic in Richard III, 1921. He gave memorable performances as Hercule Poirot in Black Coffee, 1931; Osear



Francis L. Sullivan,
British actor

Wilde in the play of that name, 1939; Mr. Crispin in The Man with Red Hair, 1942. His particular assets were a dominating figure and a deep, richly coloured voice, admirably suited to heavy character parts. He entered films in 1933, and among many rôles portrayed on the screen were three Dickensian studies: Jaggers, in Great Expectations, 1936 and 1946; Jasper, in Edwin Drood, 1937; Bumble, in Oliver Twist, 1948.

Sullivan, JOHN LAWRENCE (1858-1918). American pugilist. He was born at Boston, Mass.,



J. L. Sullivan,
American pugilist

Oct. 15, 1858. On Feb. 7, 1882, he knocked out Paddy Ryan in nine rounds. He beat Charlie Mitchell, May 14, 1883, in three rounds at New York, and in 1888 fought a draw with him of 39 rounds at Chantilly, France. In the following year

Sullivan won the heavyweight championship of America by beating Jake Kilrain in 75 rounds at Richburg. He was defeated by Jim Corbett, Sept. 7, 1892, at New Orleans. Sullivan died Feb. 2, 1918.

Sullivan, JOHN WILLIAM NAVIN (1886-1937). British journalist. Born of a poor family, he studied science and mathematics in private, and later at University College, London. He had a varied journalistic career, but eventually made a name as a scientific populariser, writing for The Times and other journals. The first of his books to attract wide attention was Aspects of Science, 1922. Later he wrote Atoms and Electrons, 1924; and Three Men Discuss Relativity, 1926. He then entered a new field to publish a study of Beethoven, 1927, and in 1932 appeared a semi-fictional autobiography, But for the Grace of God. Sullivan died Aug. 12, 1937.

Sully, JAMES (1842-1923). British psychological writer. Born at Bridgwater, March 3, 1842, and educated at Taunton, at Regent's Park College, London, and at Göttingen and Berlin universities, he was professor of philosophy at University College, London, 1892-1903. According to him, psychology is the science which aims at an accurate and systematic description of the various mental phenomena. The feelings have an intellectual and emotional side, and are characterised by quality, intensity, and massiveness or extensivity. His works include Pessimism, 1877; Outlines of Psychology, 1884; The Human Mind, 1892. He died Nov. 1, 1923.

Sully, MAXIMILIEN DE BÉTHUNE, DUKE OF (1560-1641). French statesman. Born at Rosny, near Mantes, Dec. 13, 1560, his father being baron of Rosny, Sully, then called Rosny, joined the court of Henry IV, king of Navarre, about 1571. He studied in Paris, and in civil wars fought on the Protestant side.

In 1597 Sully became superintendent of finances, and henceforward he was Henry's chief adviser. His control over every department of state was real. He did much to improve the wretched condition to which France had been reduced. Taxes were lightened, and the wasteful and corrupt system of

collecting them reformed; roads and bridges were built, and something was done for agriculture, the one industry he valued, while the defences of the country were not neglected. He found time to go on missions abroad and to take part in campaigns. Soon after Henry's death in 1610 he resigned his offices, and the rest of his life was mostly passed in retirement. A marshal from 1634, he died Dec. 22, 1641.

Sully, who was made a duke in 1606, remained throughout life a Protestant. He left some Memoirs which were published in an English translation in 1756 and 1856. The style of these is unpleasant and the tone egotistical, but they are valuable for the light they throw upon one of the great ministers of France.

Sully-Prudhomme, RENÉ FRANÇOIS ARMAND (1839-1907). French poet. He was born in Paris,



R. F. A. Sully-
Prudhomme,
French poet

March 16, 1839, and graduated in science at the Lycée Bonaparte, but devoted himself entirely to literature from 1865. He began as a disciple of Leconte de Lisle, with Stances et Poèmes, but his later work departed widely both by its intense subjectivity, e.g. Les Solitudes, Les Vaines Tendresses, and by its didacticism, e.g. La Justice, Le Bonheur, from the principles of the Parnassian school. In thought he is always pure and noble, and his verse is marked by great tenderness, subtlety, and grace. He was elected to the Academy in 1881, was awarded the Nobel prize for literature in 1901, and died Sept. 6, 1907. *Consult* Philosophie de Sully-Prudhomme, C. Hémon, 1907.

Sulpha Group. The various drugs usually grouped together under this name are described under Sulphonamide.

Sulphates. Name given to certain salts of sulphuric acid. The natural sulphates are of great economic importance and include such sulphates as Epsom salt, gypsum, celestine, barite, and chalcantithe. Sulphate of ammonia is a nitrogenous manure, produced as a by-product of gas-works. It acts rather more slowly than nitrate of soda, but contains more nitrogen, and is of particular value for malting barley, potatoes, and permanent grass. Other sulphates may be made by the interaction of sulphuric acid with a metal or metallic



Duke of Sully,
French statesman

oxide, or by the oxidation of a sulphide. Most sulphates are soluble in water, and are well-formed crystals, containing water of crystallisation. The alums, which contain 12 molecules of water, are double sulphates of aluminium with potassium, chromium, or other elements. See Sulphur; Sulphuric Acid.

Sulphocyanates. Salts of sulphocyanic acid, also known as thiocyanates and rhodanides. Sulphocyanates are prepared by direct union of sulphur with potassium cyanide, or in the case of ammonium sulphocyanate by warming an alcoholic mixture of carbon bisulphide and ammonia. A certain amount of ammonium sulphocyanate is obtained as a by-product in the manufacture of coal gas. Gas liquor contains from 2 to 3 p.c. of ammonium sulphocyanate (NH_4CNS), but Laming's iron oxide used in the purifying of coal gas is a more economical source as this substance contains from 10 to 12 p.c. of ammonium sulphocyanate. The soluble sulphocyanates are used in analytical chemistry as a test for iron in the form of a ferric salt, a blood-red colour being obtained when ammonium or potassium sulphocyanate is added to iron chloride solution. The sulphocyanates are also much used in dyeing. Mercury sulphocyanate is employed in making the toy called Pharaoh's serpent (*q.v.*).

Sulphonal ($\text{C}_7\text{H}_{10}\text{S}_2\text{O}_4$). Colourless crystalline compound made by oxidation of the product of interaction of ethyl mercaptan and acetone. Sulphonal and methylsulphonal were formerly widely used in medicine as hypnotic drugs, but have been superseded by the barbituric acid derivatives.

Sulphonamide. In chemistry, amide of a sulphonic acid. A large number of sulphonamide derivatives have been developed for use in medicine for the treatment of certain infections. The group known as the sulpha group contains as its simplest member sulphanilamide, (para-aminobenzene-sulphonamide), a white, odourless, crystalline compound with a slightly sweet taste, first synthesised by Gelmo in 1908. Interest in the sulpha group from a medical point of view was first aroused in 1935 when the German chemist Domagk while developing aniline dyes announced that the azo-dye prontosil (red) would cure streptococcal septicaemia in mice, an observation later confirmed by French workers. It was noted, moreover, that sulphanilamide was

the essential part of the molecule and was effective by itself. Interest in this new field of bacterial chemotherapy was further stimulated by the work of British investigators who confirmed these findings. The use of the sulpha group was soon extended to the treatment of infections other than those due to haemolytic streptococci, and numerous derivatives were developed. Sulphapyridine (M and B 693) synthesised in Britain by Ewins and Phillips and first reported by Whitby in 1938, was soon shown to have particular value in pneumococcal invasion. Other compounds in the group include sulphacetamide, sulphathiazole, sulphadiazine, and sulphaguanidine. The principal value of the sulpha group lies in the fact that they represent the first chemotherapeutic agents active when taken by mouth with a definite effect against dangerous bacteria, while relatively harmless to the patient. Their action is bacteriostatic, and they prevent multiplication of certain attacking microorganisms; thus the natural defence mechanisms of the body are given the opportunity of destroying the invaders, and the invaders cannot increase in number. In the treatment of serious infection, large initial doses are given in order to raise the concentration of the drug as rapidly as possible in the blood to an effective level.

Much fluid should accompany the taking of the sulpha group, as otherwise ill effects may follow blockage of the kidney tubules. Prolonged courses affect the blood corpuscles adversely. In urinary complaints which are amenable to the substance, relatively small doses are effective.

Sulphonic Acids. Acids containing the sulpha group (SO_3OH), united to carbon. Sulphonic acids of the aliphatic and aromatic hydrocarbons are known, those of the aromatic series being more important. The aliphatic sulphonic acids are made by several processes such as the oxidation of the mercaptans (*q.v.*) with nitric acid. They are thick liquids and readily soluble in water.

Sulphonic acids of the aromatic series are readily obtained by digesting the hydrocarbon with sulphuric acid. Benzene monosulphonic acid, a substance in fine deliquescent needles, is prepared by heating benzene with an equal volume of concentrated sulphuric acid in a vessel fitted with an inverted condenser for 20 to 30 hours. The operation, much em-

ployed in organic chemistry, is known as sulphonation. In the manufacture of aniline dyes it is often found that a soluble dye is obtained by sulphonating.

Sulphur. One of the non-metallic elements. Its symbol is S, atomic number 16, and atomic weight 32.06. It occurs in the free state in volcanic districts, especially in Sicily and in the United States, and in a state of combination with other elements in all parts of the world. It was well known to the Greeks and Romans, who used it as a bleaching agent and a fumigant. Iron pyrites (iron bisulphide, FeS_2), galena (lead sulphide, PbS), blende (zinc sulphide, ZnS), cinnabar (mercury sulphide, HgS) are among the more important sulphide ores; gypsum (calcium sulphate, $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) and heavy spar (barium sulphate, BaSO_4) typify the naturally occurring sulphates. Proteins, certain essential oils, some mineral oils, and many other animal and vegetable substances contain small amounts of sulphur.

Most of the sulphur of commerce is derived by the Frasch process from the great deposits which are found in Louisiana and Texas, where the deposits have supplanted the mines of Sicily as the world's most important source. In the U.S. almost pure sulphur is obtained by sinking into the earth a pipe system through which circulates superheated water, and hot air under pressure; the sulphur is liquefied and forced to the surface by an air lift. In Sicily, the rough material contains earthy impurities from which it is purified by distillation in an iron retort, whence it passes into a large cooling chamber, where it falls like snow in the form of minute yellow crystals which constitute the sublimed sulphur of commerce; or the vapour is condensed to a liquid which is run into moulds to form on solidification sticks of roll sulphur or brimstone. If sulphur is boiled with lime in water, a solution is formed which, on the addition of hydrochloric acid, yields a precipitate of white amorphous sulphur (milk of sulphur).

Sulphur is remarkable for the many physical changes which it undergoes with rise of temperature. It melts at 115°C ., forming a liquid which is pale yellow and limpid, but it becomes thicker and darker on the further application of heat, until at 200° it is almost black and so thick as to be scarcely pourable: on still stronger heating it becomes much thinner again, also lighter in colour, until at 444.6°C . it boils,

forming a heavy reddish-brown vapour. If this very hot liquid be poured in a thin stream into water, it forms an elastic, rubber-like mass of plastic sulphur.

Ordinary sulphur is a bright yellow crystalline substance, without appreciable taste or odour; sp. gr. 2.05; insoluble in water; soluble in carbon disulphide; heated in air to 260° C., it takes fire and burns with a blue flame, producing sulphur dioxide, SO_2 , together with a little sulphur trioxide, SO_3 . It combines directly with several other elements forming sulphides. The chief applications of sulphur are to the manufacture of sulphuric acid, carbon disulphide, gunpowder, and the vulcanisation of indiarubber. Medicinally, sulphur is used internally as a laxative, externally in an ointment for scabies, etc., sulphur candles are burned for fumigation.

Sulphuretted hydrogen or hydrogen sulphide, H_2S , is the gas possessing the unpleasant smell of rotten eggs, which characterises the waters of sulphur springs. It is a colourless gas used in chemical analysis as a test for many metals. Traces in the air tarnish metals.

Sulphur dioxide or sulphurous anhydride, SO_2 , is formed when sulphur burns in air. It is a colourless gas, having the suffocating odour of burning brimstone, and is very soluble in water, the solution being known as sulphurous acid, H_2SO_3 . Both gas and solution are much used for bleaching, antiseptic and food-preserving purposes.

Sulphur trioxide, SO_3 , is obtained by the oxidation of sulphur dioxide by air in the presence of a catalyst, usually platinum.

Sulphur trioxide reacts violently with water, forming a number of hydrates, the most important of which is sulphuric acid. Sulphur trioxide dissolves in concentrated sulphuric acid in various proportions, and so produces the various grades of fuming sulphuric acid or "oleum," which, as well as the trioxide itself, are widely used in chemical industry.

Sulphuric Acid. Oil of vitriol, H_2SO_4 . The manufacture of this acid is one of the fundamental chemical industries. We are dependent on it for much of our washing soda, spirit of salt, nitric acid, explosives, dyes, etc.

There are two chief processes of sulphuric acid manufacture—the "lead chamber" process and the "contact" process.

The former comprises the following contributory processes. Sulphur dioxide is produced by burn-

ing sulphur or iron pyrites, FeS_2 , in suitable furnaces and conducting the gas into huge leaden chambers, about 100 ft. by 20 ft. by 20 ft. Nitric acid vapour is produced by distilling a mixture of sodium nitrate, NaNO_3 , and sulphuric acid in "nitre pots," and carried into the chamber along with the sulphur dioxide and a current of air. A little steam is also injected, but into other parts of the chamber. The chamber is merely an enclosed space wherein the four vapours may mingle, and by their reaction produce clouds of sulphuric acid which fall to the bottom of the chamber, whence it is drawn off from time to time. The nitric acid vapour merely helps the oxygen of the air to combine with the water and sulphur dioxide, and is used over and over again. This chamber acid, containing 70 p.c. of real acid, is concentrated in leaden pans to produce brown oil of vitriol, or in glass retorts to produce concentrated sulphuric acid, or oil of vitriol. The purest acid is distilled in platinum stills.

The contact process has already been outlined under sulphur trioxide in the article Sulphur. A mixture of sulphur dioxide, SO_2 , and air issues from a kiln in which pyrites, FeS_2 , or zinc blende, ZnS , is burnt, and meets jets of steam in a chamber whereby it is purified from dust, arsenic, and other impurities. The removal of elements such as arsenic, which frequently occur in small quantities, is important, as they may poison the catalyst. The mixture of gases is then perfectly dried by passing it through strong sulphuric acid before it enters the contact-chamber, which is filled with perforated shelves on which platinised asbestos is spread, and kept at a temperature of about 350°. Here the gases combine to form sulphur trioxide, SO_3 , which is received in closed vessels containing water, with which it combines to form the acid.

Concentrated sulphuric acid or oil of vitriol is a heavy, colourless, odourless liquid of oily consistence, sp. gr. 1.84, containing 96 p.c. of the real acid, H_2SO_4 . It boils at 338° with the formation of exceedingly irritating vapours. When mixed with water it generates a great deal of heat, owing to the intense affinity which the acid has for water. Many of its uses depend on this property, e.g. alcohol, on being heated with it, loses the elements of water and produces ether (g.v.) or ethylene (g.v.), according to the conditions of experiment.

Moist air, or other gas, loses every trace of moisture by being bubbled through the acid. It is very corrosive; it produces painful wounds on the skin and destroys nearly all vegetable and animal substances. Under various circumstances it attacks nearly all the metals, producing their respective sulphates. It reacts with oxides, hydroxides, and carbonates in the production of sulphates.

SULPHURIC ACID, POISONING BY.

Concentrated sulphuric acid is a powerful poison, and is occasionally taken by accident or with suicidal intent. A teaspoonful is likely to prove fatal. Calomel and magnesia is the best antidote, but if this is not available sodium bicarbonate, chalk, whitening, or even ceiling plaster may be given. If none of these substances are at hand, the acid should be diluted by administering quantities of water.

Sulphurous Acid (H_2SO_3).

Acid, known only in solution, formed when sulphur dioxide is dissolved in water. The liquid smells strongly of sulphur dioxide, SO_2 , and forms salts known as sulphites, of which there are two varieties, the normal and acid salts, in the latter of which only one hydrogen atom is replaced by a metal. See Sulphur.

Sulpicians. R.C. society of secular priests. It was founded in 1645 by Jean Jacques Olier, when curé of S. Sulpice, Paris. Its object was to train young men for the priesthood; and the seminary of S. Sulpice was the outcome. Napoleon suppressed the society in 1812; it was re-established at the Restoration, but since the disestablishment of the Church in France has been converted to secular uses.

Sultan. Mahomedan title meaning ruler. It was used for the ruler of the Turkish dominions until 1922, when the national assembly at Ankara abolished the office. It is also applied to other princes, e.g. those of Morocco and Johore. The feminine is sultana. See Turkey.

Sultana. Small seedless raisin.

Sultanas are prepared in a similar way to raisins, from sun-dried white grapes grown in European Turkey and near Izmir.

Sultanpur. Dist. and town of the Uttar union, India, in the Fyzabad division. The dist. is situated on both sides of the Gumti, N. of Allahabad. Rice, wheat, and barley are the chief crops. Area, 1,699 sq. m. Pop. 1,100,368. The town is on the Gumti on the rly. due N. from Allahabad to Fyzabad. Pop. 10,450.

Sulu. Archipelago of more than 400 islands forming the southern.

most group of the Philippine Islands. They extend between Mindanao and Borneo and separate Sulu Sea from Celebes Sea. Their area is 1,560 sq. m. The larger islands are of volcanic formation, the smaller coral. Rice, coffee, indigo, sesame, hemp, and cocoa are produced, and other industries include pearl and shell fishing, cord manufacture, and weaving. Pop. est. 120,000, most of whom are Moros. The largest island, Sulu or Jolo, has an area of 326 sq. m., a mountainous interior (Tumatanguis, 2,940 ft.), and a fertile soil. Pop. est. 45,000. The capital is Sulu or Jolo on the N.W. coast of Sulu Island; it has a good roadstead.

Sumac or **SUMACH** (*Rhus*). Genus of trees and shrubs of the family Anacardiaceae. Natives of temperate regions, the species are mostly poisonous in varying degree. The alternate leaves may be undivided, divided into three leaflets, or intricately divided by numerous leaflets being again deeply cut. The small flowers usually form dense clusters, the sexes sometimes on separate plants. *R. coriaria* affords the commercial sumac used for tanning, and *R. cotinus* the yellow dye-stuff known as young fustic, old fustic being *Maclura tinctoria*. *R. verniciflua* yields Japanese lacquer and *R. succedanea* red lacquer; the first from the milky sap, the second from the fruits. *R. toxicodendron* (poison ivy) and *R. venenata* (poison elder) are the two most deadly species, it being dangerous even to handle cut branches.

Sumatra. Island of the Malay archipelago. It is the sixth largest island in the world, being 1,115 m. long and 275 m. across at its greatest breadth. Its area is 165,000 sq. m. It lies between the Indian Ocean and the S.W. Pacific, and is separated from the Malay pen. by the narrow Malacca Strait, and from the western tip of Java by the Sunda Strait.

Lying roughly N.W.-S.E., the island extends from 5° 40' N. lat. to 5° 59' S. lat., being bisected by the equator, and from 95° 16' to 106° 3' 45' E. long. Strong squalls, accompanied by thunder, lightning and torrential rain, and called *sumatras*, occur frequently in the Malacca Strait during the period of the S.W. monsoon, i.e. April-Nov. The warm seas and the mountainous nature of this region cause the rainfall to be extremely heavy. Its pop. numbers some 8,000,000, including about 21,000 Europeans.

A high mountain chain, the Bukit Barisan, runs for 1,000 m. along the western coast, with many volcanic peaks rising from 5,000 to over 12,000 ft. Accordingly, though the river system is extensive, the rivers on the W. are mostly unnavigable. On the E., however, they are the best means of communication, and are of great importance. The largest are the Asahan, which drains Lake Toba, one of Sumatra's many lakes, the Rokan, the Kampar, the Jambi, and the Musi.

Sumatra's natural wealth is largely unexploited. There are immense forests, and products other than timber include rice, sugar, coffee, pepper, rubber. Excellent tobacco is grown at Deli, and copra, sisal, and some tea are exported. Minerals include small quantities of gold, silver, sulphur, and lead, with oil deposits near Palembang and at Jambi, and on the E. coast, N. of Medan, and in Achin. There is coal in the basins of the Ambilin and Lematang rivers, and tin mines in the neighbouring E. coast islands of Billiton and Banka, and on the small island of Bintan, in the Riouw Archipelago. Total output of crude oil in 1939 was 5,320,290 tons, and of coal 1,222,406 tons.

The chief ports are Padang in the W., Palembang in the S.E., Belawan in the N.E., and Sabang in the N. Transport is chiefly by water, but there are nearly 16,000 m. of roads. There are also 1,233 m. of rlys. Air services are maintained between Batavia, capital of Java, Palembang, and Medan, and between Batavia, Palembang, and Singapore.

The native peoples are chiefly of Batak, Menangkaban, and other Malayan stocks. The Menangkabans are the most advanced, and are famous for architecture, silversmiths' work, and weaving. They live on the plateaux above Padang, on the west coast.

Civilized first by the Hindus in the 7th century, Sumatra came under Muslim influence six centuries later, and most of its people are Muslims. Known from early times to the traders of India and China the island made its first contact with the West with the arrival in 1508 of the Portuguese explorer Lopez de Figueroa, who was soon followed by other adventurers from Lisbon. They established flourishing trade settlements on the coast, but were ousted by the Dutch towards the end of the 16th century. For later history, see Indonesia.

Sumba (Du. Soemba), TJENDANA, OR SANDALWOOD. Island of Indonesia, sometimes included in the Lesser Sunda group. It lies S. of Flores, from which it is separated by the Sumba Strait, in about lat. 10° S., long. 120° E. With an area of some 4,500 sq. m., it is a plateau rising to about 3,500 ft. Most of the quarter of a million inhabitants are Malays. The chief town is Waingapu. Valuable timber, including sandalwood, cotton, horses, and tortoiseshell are exported. In Japanese occupation 1942-45, Sumba became part of the state of E. Indonesia 1947. See Indonesia.

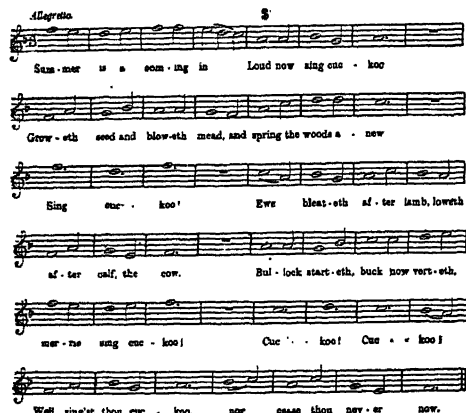
Sumbawa (Du. Soembawa). Island of Indonesia. It is one of the Lesser Sunda islands and is situated between Lombok and Flores. Of the four mt. ranges which cross the island from N. to W. the N. range (the highest) is volcanic, and rises to 9,042 ft. in Tambora, which had a disastrous eruption in 1815.

The area is 4,300 sq. m. and the pop. some 180,000, of whom 11,000 are foreign traders. In Japanese occupation 1942-45, Sumbawa became part of the state of E. Indonesia 1947. See Indonesia.

Sumer or **SHUMER**. Ancient name of the lower Euphrates plain afterwards called Babylonia. It is the biblical land of Shinar (Gen. 10). The Sumerians, earliest known inhabitants of Babylonia, gave their name to Sumerian culture and the Sumerian age. By some they are supposed to have lived in the S. of the country, the Akkadians inhabiting the N. See Babylonia; Chaldeans; Cuneiform; Elam; Gudea; Hammurabi Code; Patesi.

Sumer is icumen in (Summer is come). A musical round or rota, the MS. of which is in the British Museum. The composer is unknown, but the transcription (ascribed to John of Fornssete, a monk at Reading Abbey) dates from about 1226. It is beyond doubt the oldest piece of harmonised secular music extant. The melody, which is not modal, but in the key of F, is of folk-song character. The composer treated it in canon (*g.v.*) for four equal voices, either tenors or trebles, placing below it a pes or burden for two basses. The words are in the 13th century Wessex, but there is also a set of Latin words, which were possibly added by the transcriber, of a Hymn to the Saviour, so as to turn it into a motet.

The melody is pleasant and pastoral, and though it has a few crudities, the whole is an eloquent



Sumi is scumen in. The round in modern notation and with a modern version of the words

testimony to the advanced state of English contrapuntal music anterior to the 13th century.

Sumi, or **SUMY**. Town of Ukraine S.S.R., capital of the region of the same name. It is situated 90 m. N.W. of Kharkov, on the Psiol, a trib. of the Dnieper, and the Kharkov-Glukhov rly. It is a centre for trade in grain and horses. Captured by the Germans during Oct., 1941, Sumi was made by them into a base. The Russians retook it Feb. 23, 1943, but were forced to evacuate it some days later during the new German drive which recaptured Kharkov. It was eventually liberated Sept. 2, 1943. Pop. 63,833.

SUMIDA or **SCUMIDA-GAWA**. River of Honshu, Japan. It flows N., E., and S.E. for nearly 200 m., passing through Tokyo to enter the Bay of Tokyo. It is navigable for 50 m. for medium sized vessels.

Summary Jurisdiction. Jurisdiction of a court to make an order summarily, i.e. forthwith. Thus justices of the peace in petty session have a summary jurisdiction in cases of minor crimes, i.e. they can straightway fine or imprison the offender. But in other cases, e.g. murder, burglary, treason, they have no right to try the alleged offender, but must, if a case is made out, commit him for trial to a higher court.

A court of summary jurisdiction is one of a justice or justices of the peace or of a stipendiary magistrate, or any other court to whom power is given to act under the Summary Jurisdiction Acts. See **Magistrate**.

Summer. Second season of the year. In the N. hemisphere it comprises popularly June, July, and Aug., and the same period is

weather in autumn or early winter. See **Season**.

Summerskill, **EDITH CLARA** (b. 1901). British politician. A Londoner, she was educated at King's College and completed her training as a doctor at Charing Cross hospital. She qualified in 1924, and married a fellow practitioner, E. J. Samuel, in 1925. Joining the Labour party, she was on the Middlesex county council during 1931-41, and became M.P. for W. Fulham in 1938. She was parl. secretary to the ministry of food from 1945 to 1950, when she became minister of national insurance. She published *Babies Without Tears*, 1941.

Summer Time. Method of increasing the hours of daylight activity in summer by advancing, on a specified date in spring, official time one hour compared with Greenwich mean time, which is restored on a date in autumn. Advantages of this practice were first suggested by Benjamin Franklin, but it was William Willett, a London builder, who founded the Waste of Daylight movement, and in 1908 had a Daylight Saving bill introduced into parliament. In 1916 parliament passed as a wartime measure an Act ordaining that during a defined period that year the legal time should be one hour ahead of G.M.T.

The Act was renewed each year until 1925, when it was made permanent, summer time being

adopted by British meteorologists. The word is also applied to summer-like periods, in other seasons, e.g. St. Martin's or St. Martin's little summer, about St. Martin's day, Nov. 11, sometimes used figuratively for prosperity after adversity; St. Luke's or St. Luke's little summer, about St. Luke's day, Oct. 18; and Indian summer, the name given especially in the upper Mississippi Valley to a period of calm rainless, mild, hazy weather in autumn or early

defined as the period beginning at 2 a.m. G.M.T. on the day following the third Sat. in April—unless that were Easter, in which even summer time would start a week earlier—and ending at 2 a.m. G.M.T. on the day following the first Sat. in Oct. At the outbreak of the Second Great War, summer time for 1939 was extended until Nov. 19, and in 1940 it began on Feb. 25, to last throughout the War. Not until Oct. 7, 1945, was G.M.T. restored. During some years of the Second Great War clocks were advanced two hours instead of one: dates on which double summer time applied are given under that heading.

Summer time was introduced in Germany in 1917, abolished in 1919, and brought back as a wartime measure in 1940. France adopted the system in 1916, and in 1923 fixed the period as from the last Sat. in March until the first Sat. in Oct. The difference for a few weeks between British and French clocks disorganized cross-Channel traffic, and at the outbreak of war French and British summer times were synchronised; but in 1940 France was obliged to adopt German time. In 1917 the scheme was introduced into the Netherlands; it lapsed in 1923, was revived in 1925 to assist the tourist interests, but in 1928 was modified to apply to transport services only. Spain observed summer time only during 1919-23. Denmark tried it in 1917, but ceased to do so after 1919 because of its unpopularity with farmers. In the Second Great War all Axis and occupied countries observed German summer time. In 1946 the Western European countries for the first time advanced clocks an hour on a common date.

There is no general regulation in Canada, an Act of 1918 admitting local option. Most towns observe summer time, but country districts seldom. Local decision also applies in the U.S.A., where New York, Chicago, Boston, and other business centres generally follow British practice; summer time is not generally observed in rural areas. It was introduced nationally as a war measure in 1941. Australia observed summer time in 1916-18 only, but New Zealand has used it since 1929. Argentina started it in 1930, Chile and Brazil the next year.

Summing Up. A statement by a judge to a jury before he calls on them to pronounce a verdict. It normally recapitulates



Edith Summerskill, British politician

the evidence on the facts of which the jury must decide, and declares the law applicable to the case, decision as to which is the judge's alone. *See* Trial.

Summons (Lat. *summonēre*, to give a hint). In law, a request, in the nature of an order, to anyone to appear in a court of justice. In Great Britain a summons to a person charged with an offence must always state the nature of the summons, so that he may be prepared to argue the case and call evidence. The day and hour must also be specified. *See* Writ.

Sumner, CHARLES (1811-74). American politician. Born at Boston, Mass., Jan. 6, 1811, he was educated at Harvard and called to the bar in 1834. In 1851 he was elected senator as a Democrat and Free-soiler, and three times as a Republican in later years.



Charles Sumner.
American statesman

Throughout his career he was an uncompromising opponent of slavery. In 1856 he was violently assaulted in the senate by P. S. Brooks, a relative of whom had been bitterly attacked by Sumner in one of his speeches. During 1861-71 Sumner was chairman of the committee on foreign relations. He was in favour of giving votes to negroes, and supported the Civil Rights bill for granting them equality of treatment with whites. He died March 11, 1874.

Sumner, JAMES BATCHELLER (b. 1887). American biochemist. He was born at Canton, Mass., Nov. 19, 1887, and educated at Harvard university, afterwards doing research work at Brussels. He joined the staff of Cornell university medical school in 1914, and became professor of biochemistry there in 1929. He did much valuable investigation on enzymes, being the first to isolate one in a pure state. For this work he was awarded half the Nobel prize for chemistry in 1946, the other half being divided between W. M. Stanley and J. H. Northrop.

Sump. Lowest part of the shaft of a mine, into which water drains. By extension, any well to drain land, e.g. before laying foundations, is also called a sump. On internal combustion engines the oil reservoir in the lower part of the crankcase is called the sump. A pump draws oil thence

through a filter, and the oil, after lubricating the bearings, cylinder, and walls runs down the sides of the crankcase back into the sump. In splash lubricating systems the sump carries troughs, one of which is disposed under each of the big end bearings. Many sumps are cast with ridges or fins to assist in keeping the oil cool.

Sumptuary Laws (Lat. *sumptus*, expense). Statutes to repress private extravagance and luxury. They also aim at safeguarding the prestige of privileged classes, directing trade and industry into desired channels, and raising revenue, although such legislation never has purely financial aims.

The laws of Solon at Athens afford an example of early sumptuary legislation, but in Sparta much greater simplicity of manners was enforced. From 215 B.C.

the Roman republic endeavoured to check corruption, spreading with decadent Hellenic culture, by a series of laws, among which the measures taken by Cato the Censor are famous. Women's dress, banquets, and domestic slaves were the chief objects of Roman sumptuary legislation, of which little is heard after the 1st century A.D.

In medieval Europe, sumptuary laws were made by the emperor Frederick II. In England regulations against luxury in food were promulgated under Edward II and subsequently. A series of Acts of parliament, beginning 1363, placed restrictions on expensive apparel, graduated according to rank. Other regulations, relating to such matters as plate and liveried retainers, were made. In 1603 most of these laws, which had already fallen into a bygone, were repealed.

THE SUN: AS SEEN BY MODERN SCIENCE

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Related articles include those on Astronomy; Planet; Stars. See Light; Relativity; Spectroscopy; Telescope; and the entries on famous astronomers; also colour plate Solar System

The sun is to us by far the most important of the heavenly bodies. Its attractive power keeps the planets circling round it, its light and heat are indispensable for the preservation of animal and vegetable life. From the earliest times men have recognized its beneficent power, but it is only in modern times that its grandeur has been fully realized. The ancient Greeks determined the moon's distance correctly, but estimated the sun's distance as only $4\frac{1}{2}$ million m., this estimate holding the field for 2,000 years. After the invention of the telescope it was found that the true distance is much greater. The now accepted value of the average distance, 93,004,000 m., is probably within 20,000 m. of the truth. The sun, however, is not exactly in the centre of the earth's orbit, and we are 3,000,000 m. nearer to it in Jan. than in July. Once the distance is known, the size is deduced by measuring the angle subtended by the sun, which gives a diameter of 865,400 m., 109 times that of the earth, and a bulk 1,306,000 times that of the earth. The sun's mass or weight is 333,420 times the earth's, so that the density of the sun is $\frac{1}{160}$ that of the earth, or $1\frac{1}{160}$ that of water.

Telescopic study of the sun's surface began with Galileo. He found some dark spots on the sun, which moved across its disk in about a fortnight, from which he correctly inferred that the sun is

rotating in 25 days. Prolonged observations have shown that the rotation period varies in different solar latitudes. The equator takes 25 days; regions in latitude 30° take 27 days, and in latitude 45° 29 days.

Two centuries after the discovery of sunspots Schwabe detected that they wax and wane in size and number in a period that averages 11 years. All forms of solar activity share in the variation, which also synchronises with a variation in terrestrial magnetism. Years of many spots have active magnetic disturbances, and frequent auroral displays and interference with radio communications. Study of the sun with the spectrohelioscope (*q.v.*) has shown that these terrestrial effects are due not directly to the spots but to fleeting bright eruptions near them, called flares. Charged particles, shot out by these flares at speeds up to about 1,000 m. a sec., reach the earth a day later and cause disturbances by electrifying the upper atmosphere.

Sunspots undergo a remarkable shift in latitude during the sunspot cycle. Soon after minimum they break out at distances of 30° , or thereabouts, from the equator, on either side. As the cycle advances they gradually close in on the equator, reaching a limit of about 4° from it when the next minimum is attained. They linger here for a year or two after the next series of

high-latitude spots has appeared, so that the two cycles overlap.

The brilliant surface of the sun, known as the photosphere, presents a mottled aspect in the telescope that has been compared to rice-grains or willow-leaves. Of late years many lines of research have indicated a figure close to $6,000^{\circ}\text{C}$. as the temperature of the sun's radiating surface.

Discoveries during Eclipses

Outside the photosphere there are three appendages, all discovered during total eclipses; the outermost is the corona, an ethereal veil which stretches out to a vast distance, sometimes millions of miles from the sun. Until 1931 study of the corona had to be confined to the fleeting moments of total eclipses, but in that year Lyot devised a coronagraph with which he successfully photographed the inner corona in full sunlight. The bright spectrum lines of the inner corona remained unidentified until in 1942 Edlén proved that they were due to iron, nickel, and calcium at a temperature of about a million degrees C. The light from the outer corona is sunlight diffused by clouds of electrons.

The corona changes markedly in aspect during the sunspot cycle. At minimum it is spread out in two long wings in the equatorial regions, the poles having merely a set of delicate curved plumes. At maximum the corona is distributed evenly round the limb, but there are often signs of special disturbance in the neighbourhood of large sunspots.

The chromosphere is inside the corona, and was discovered during eclipses, but can now be studied at any time with the aid of the spectroscopic. It is bright red, and gives rise to prominences, uprushes of glowing gas, chiefly hydrogen, which is ejected at great speed from the sun's surface, and rises to heights of 200,000 m. The streamers then bend over and descend, forming fantastic shapes. There are also quiescent prominences, resembling our clouds; these are seen even at the poles; the eruptive ones are confined to the spot zones.

Below the chromosphere is the reversing layer, the true solar atmosphere. The solar spectrum is crossed by a vast number of dark lines, which arise from the absorption of sunlight by the gases in this layer. About 60 known elements are present there in a gaseous state, the lines of iron being especially numerous. In total eclipses, when

the sun is just covered, we see the reversing layer without the photosphere, and the spectral lines suddenly change from dark to bright. The degree of excitation in this flash spectrum (*q.v.*) suggests a temperature of about $35,000^{\circ}\text{C}$. The temperature of the sun thus seems to increase outwards, from $6,000^{\circ}$ at the surface, through $35,000^{\circ}$ in the reversing layer and lower chromosphere, to about a million degrees in the corona. No theoretical explanation of this unexpected behaviour is available.

Use of the Spectroheliograph

During the 20th cent. great advances in knowledge of solar physics have been made by the spectroheliograph (*q.v.*). Most spectroheliograph photographs are taken in the lines of calcium and hydrogen. These gases give different results. The calcium pictures show a number of rounded luminous clouds, called flocculi, that define the limits of the sunspot zones. The hydrogen pictures show the disk covered with narrow curved streamers, apparently more disturbed than the calcium formations. Round sunspots they exhibit a spiral formation, indicating that a spot is of the nature of a whirlwind. This discovery inspired the suggestion that the whirling round of electrified particles would produce a magnetic field; the idea was tested by the spectroscopic, and some of the lines in the spot spectrum were observed to be doubled or tripled; laboratory experiments show that a magnetic field produces this effect.

Knowledge of the sun's atmosphere has been rapidly extended by the use of cinematography. Photographs of the chromosphere and prominences, taken every few minutes either with a spectroheliograph or with an extremely selective polarising filter which isolates the desired wavelength optically, are projected at normal film speed. The resulting motion picture shows the movement of solar matter speeded up about a thousandfold.

The light of the sun is about 11,400 million times that of the brightest star, Sirius. This is, however, entirely due to proximity: the sun is intrinsically a star of about average brightness (actually 26 times fainter than Sirius would be at the same distance). Each square inch of its surface shines with a light of over 300,000 candle power. The energy received by the earth each year is enough to melt a layer of ice more than 100 feet thick over its whole surface,

The sun has been radiating at this prodigious rate throughout recorded history, and approximately so throughout geological time. The source of the radiation has been a matter of dispute for a century. It is now believed that at the high temperature (20 million degrees C.) in the interior, violent collisions between the stripped atomic nuclei transmute hydrogen into helium with a small loss of mass. This loss is equivalent, according to relativity theory, to an enormous release of energy, the process being in this respect similar to that occurring in the atomic bomb. If the sun loses about 4.2 million tons of its mass in this way every second, its continued radiation can be accounted for. This rate of loss is entirely insignificant to an object as big as the sun, which can continue to shine for thousands of millions of years yet.

Bibliography. The Sun, C. A. Young, 3rd ed. 1895; The Sun, C. G. Abbot, 1911; The Sun, G. Abetti, 1938; Birth and Death of the Sun, G. Gamow, 1941.

Sun and Planet Gear. System of mechanical gearing in which the gears revolve within a large outer gearwheel, all the gears being epicyclic, *i.e.* their axes revolve round a common centre. The system was invented by Watt in 1781 for the transmission of power in his steam engine. It is used for two-speed gears on bicycles and in types of motor vehicle gearboxes.

Sunart. Sea-loch of Argyllshire, Scotland. It extends for $19\frac{1}{2}$ m. between Ardnamurchan (*q.v.*) and Sunart in the N. and Morven on the S. Its mean breadth is 1 m.

Sun-bathing. Exposure of the body to the direct light of the sun. Sun-bathing was first seriously practised in the Swiss Alps, where the snow accentuates the ultra-violet content of the light. The absence of ultra-violet rays (*q.v.*), especially in the atmosphere of cities, is responsible for much ill-health, and sun-bathing in suitable open-air situations compensates this lack. The body must be exposed to the sun for short periods to begin; when acclimatised and tanning has taken place, the time can be lengthened to some hours. Too quick exposure results in nervous symptoms and generalised burning (*see* Sunburn). Special glass exists which does not keep out (as does ordinary glass) the ultra-violet rays.

Sunbeam. Name of a series of yachts. Sunbeam I belonged to the 1st Earl Brassey. Lord and

Lady Brassey journeyed thousands of miles in the vessel, and Lady Brassey's books, of which the most popular was *A Voyage in the Sunbeam*, 1878, made its name widely familiar. She died on board in 1887. During the First Great War the Sunbeam did ambulance work in the Mediterranean. It was bought by Sir W. Runciman in 1922. Sunbeam II, also the property of the Runciman family, was on war service under Admiralty orders during the Second Great War. In 1947 it was sold to the Rydbergska Stiftelsen Foundation, of Stockholm, Sweden.

Sun Bear (*Ursus malayanus*). Name popularly applied to the Malayan honey-bear. It is small in size, and has black fur with a large cream-coloured patch across the throat. It is common in the forests of Malay and the islands near, and feeds upon termites and the honey of wild bees. See Bear.

Sun Bird. Popular name for the Nectariniidae. This family of tropical birds occurs only in the E. hemisphere. They are of small size, and have gorgeous plumage glowing with metallic colours in the males, the females being very soberly coloured. They have long curved beaks, comparatively short wings, and long tails. They occur chiefly in Africa; but one handsome species is a native of Australasia. They feed upon the nectar of flowers and upon small insects. One of the most beautiful is the metallic sun bird of Equatorial Africa. The male has brilliant green plumage on the back, violet on the throat, bluish black on the wings and tail, and shining yellow on the breast. Two of the tail feathers are greatly prolonged, with expanded and rounded tips.

Sun-bittern (*Eurypyga helias*). Crane-like bird, native of Guiana and Brazil. It is about 16 ins.



Sun-bittern. Male of *Eurypyga helias* major displaying its plumage during the courting season

long, and has a long beak, and plumage striped and mottled with black, white, and brown. When the male spreads its wings in displaying, or in threatening an intruder, it has a curious resemblance to a large butterfly. The

birds are usually found about rivers, and feed upon insects. A larger sub-species (*E. h. major*), of a different colour, is found in Colombia and Central America.

Sunburn. Mild inflammatory affection of the skin due to exposure to excessive sunlight. The skin becomes bright red, hot, and somewhat swollen, with smarting and tenderness. In a few days this passes off, the cuticle is shed, and the skin shows some degree of pigmentation or bronzing. Sunburn is indeed a burn and should be treated as such.

Sunbury. Borough of Pennsylvania, U.S.A., the co. seat of Northumberland co. It stands on the Susquehanna river, 55 m. N. of Harrisburg, and is served by the Pennsylvania and the Philadelphia and Reading rlys. Its manufactures include silk and planing mills, rly. workshops, foundry and machine shops, and flour mills. Here in 1883 Edison built his first incandescent lighting plant. Sunbury was founded in 1772, and incorporated in 1797. Pop. 15,462.

Sunbury-on-Thames. Urban dist. of Middlesex, England. It stands on the Thames, 4 m. W. of Kingston and 17 m. by rly. S.W. of London. The chief building is S. Mary's church, dating from the 18th century. Sunbury is a boating centre. Within the urban dist. is Sunbury Common, where are reservoirs and works of the Metropolitan Water Board. Here is Kempton Park (q.v.), at one time a royal residence, but now famous for its racecourse. Pop. 21,500.

Sun Cracks. In geology, cracks which are formed during the drying out of wet mud, etc., on its exposure to sun and air. They usually form a polygonal pattern, and may be as much as two ins. across. They are characteristic of deposits laid down in shallow water, e.g. tidal flats or inland desert basins, where the water covering is only sporadic. Sun cracks can be observed in process of formation, and also occur in rocks laid down in the past under similar conditions.

Sundae. Name, of American origin, for ice cream served with nuts, fruit, and syrups. In the U.S.A. ice cream is frequently served as a Sunday dessert. The origin of the word *sundae* is said to be a corruption of the word Sunday. The term became common in Great Britain.

Sunda Islands. Name of the islands in the Malay Archipelago which separate the China Sea from the Indian Ocean. Sumatra, Java,

Borneo, and Celebes are the large Sunda Islands; Bali, Lombok, Sumbawa, Flores, Timor, and neighbouring smaller islands form the Lesser Sunda Islands.

Sundarbans. Region of Bengal, partly in India and partly in Pakistan. It comprises the southernmost portion of the great delta of the Ganges-Brahmaputra at the head of the Bay of Bengal. It includes a strip of 70 m. wide along a 200 m. sea front, with a total area of 6,500 sq. m. E. of the Hooghli, to the Hariabhanga, it lies in the 24 Parganas dist. of W. Bengal, India. E. of the Hariabhanga it lies partly in the Khulna and partly in the Backergunge dist. of E. Bengal, Pakistan. The S. section consists of jungle-covered islands, a malarial dist., with hundreds of watercourses, some tidal, some sluggish. In the N. dists. dams have been made to keep out the salt water, the jungle has been cleared, and cultivation extended. The predominant tree is the sundri, which yields timber for boat-building.

Sunda Strait. Strait between Java and Sumatra. It is a passage 14 m. at its narrowest, connecting the Indian Ocean with the South China Sea. Within its limits is the island of Krakatoa (q.v.).

Sunday. First day of the week, set aside by Christians for public worship in memory of the resurrection of Christ. In northern Europe it is "the Sun's Day," cf. German *Sonntag*, and among the Latin races "the Lord's Day" (*dies dominica*), cf. French *dimanche*. In the early days of Christianity, both the Sabbath and Sunday were observed as days of worship. In 321 Constantine made Sunday a day of rest in towns. In addition to those named by the Church, there are Sundays with popular names derived from words in the appointed collects, e.g. Refreshment Sunday (mid-Lent), also called Mothering Sunday; Stir up Sunday (next before Advent), etc. See Sabbath; Sunday Observance.

Sunday, WILLIAM ASHLEY (1863-1935). U.S. evangelist. Born at Ames, Iowa, he was during 1883-90 a professional baseball player, and during 1891-95 assistant-secretary of the Y.M.C.A., Chicago. He took up evangelistic work in 1896, and



"Billy" Sunday, American evangelist

become familiar on both sides of the Atlantic as "Billy" Sunday. In 1903 he was ordained as a Presbyterian minister. He died Nov. 6, 1935.

Sunday Chronicle. Manchester newspaper, since 1939 also published in London and Glasgow. It was first published 1885, and in its early days opened its columns to writers of "progressive" views. Robert Blatchford was the first leader writer, and the theatre notes of A. M. Thompson ("Dangle") did much to break down Victorian prejudices against the stage. The Sunday Referee was incorporated in 1939. The paper is owned by Kemsley Newspapers, Ltd., and its circulation in 1947 was over one million.

Sunday Dispatch. A London Sunday newspaper. Originally the Weekly Dispatch, it was founded by Robert Bell and first published Sept. 27, 1801. It has led campaigns against social evils such as flogging and imprisonment for debt, and in 1849 published Dickens's historic protest against public executions. It has also consistently urged a policy of powerful armaments for Great Britain. Acquired by Ashton Dilke in 1875, the paper was later bought by Sir George Newnes. In 1903 it passed to the ownership of Associated Newspapers Limited, and in 1928 changed its name to the Sunday Dispatch. In 1947 the circulation was over two million.

Sunday Express. A London newspaper. Founded in 1918 by Lord Beaverbrook as a Sunday edition of the Daily Express (*q.v.*), it had reached a circulation of over two and a half millions by 1947. Editors have included James Douglas and (from 1928) J. R. Gordon. There is a Manchester edition.

Sunday Graphic. London illustrated newspaper. It was founded in 1915 by Sir E. Hulton, as the Illustrated Sunday Herald, companion to the same proprietor's Daily Sketch. Both papers were purchased in 1923 by the 1st Lord Rothermere, and repurchased the following year by Allied Newspapers, Ltd. (now Kemsley Newspapers). The present name of the Sunday Graphic was adopted 1929, and in 1947 its circulation was over one million. There is a Manchester edition.

Sunday League. NATIONAL. British organization for the promotion of educational and social recreation on Sunday. The society, established in 1855, grew out of a movement which began in the

middle of the 19th century. At first it met with hostility, but in the 'sixties it was able to organize popular Sunday evening lectures. A landmark in the movement was the Sunday opening of Manchester's civic museum and library, 1877, and Birmingham and other centres followed the example. In 1897 the national galleries and museums were thrown open on Sundays. The league then worked for music in the parks, etc. Among its activities were Sunday excursions at cheap fares. The league also organizes popular Sunday evening concerts for charity. Its offices at 34, Red Lion Square, London, W.C.1, were destroyed by bombs in the Second Great War and replaced by a temporary building.

Sunday Observance. Keeping Sunday as a day of rest. The custom followed naturally upon the establishment of Christianity as a state religion of the Roman empire. In England as early as 960, Edgar ordered the Sabbath to be kept holy from 3 p.m. on Sat. until daybreak on Mon. The 17th century brought several enactments on the subject. In 1606 absence from divine worship on Sunday was made punishable by a fine; in 1618 certain sports were allowed after service time. The growth of Puritan ideas imposed restrictions on Sunday amusements in 1625, and an Act of 1677 forbade all work, except what was necessary—this included haircutting and shaving, and selling perishable goods—or had a charitable object.

In England public houses are open on Sunday within certain hours only; in Wales they are closed under an Act of 1881; in Scotland hotels may sell intoxicating liquor to lodgers and travellers. In overseas parts of the British Empire conditions vary, as they do in different states of the U.S.A. By the Bread Act of 1836, making bread or cakes on Sunday, or selling them after 1.30 p.m., is punishable by fine. Fishing is permissible, by an Act of 1861, only for salmon with rod and line. It is an offence to take or kill game on a Sunday, but rabbits are excluded.

Sunday entertainments at which a charge is made for admittance were forbidden by an Act of 1780, but its effect was largely stultified by the device of admitting the public free and charging only for reserved seats or programmes. The Sunday Entertainments Act of 1932 permitted cinema performances, at the option of the local

authority, musical entertainments, lectures, debates, and the opening of museums, picture galleries, and zoological and botanical gardens. Penalties for infringements of Sunday Observance Acts can be claimed by a common informer (*q.v.*). See Early Closing; Licensing Laws; Lord's Day Observance Society.

Sunday Pictorial. London illustrated newspaper, the first of its kind in Great Britain. The first issue, in March, 1915, preceded by one week the first issue of the Illustrated Sunday Herald, later called the Sunday Graphic. Sunday Pictorial was founded by the 1st Viscount Rothermere, then chief owner of the Daily Mirror. It is owned by Sunday Pictorial Newspapers (1920) Ltd., a firm closely allied with that owning the Daily Mirror. The circulation in 1947 was over 3,800,000.

Sunday School. Institution where religious instruction is given to children and others on Sunday. The Sunday school movement was founded in England by Robert Raikes (*q.v.*), who in 1780 started a Sunday school in Gloucester. Other men in other places had previously made fitful experiments in the religious instruction of children, but Raikes originated the Sunday school as now known.

His efforts were strengthened by the Sunday School Society, founded by William Fox, 1785, and by the end of the 18th century schools were established throughout the kingdom.

The greatest impetus to the institution came from the Sunday School Union, an inter-denominational organization formed in London, 1803, which ultimately superseded the Sunday School Society. By the starting of branch unions throughout the land, by the institution of lesson systems, and the issue of explanatory notes, magazines, papers, handbooks, and song books for teachers and scholars; by the organizing of lecture conferences and conventions; and by the promotion of Sunday schools in Europe, India, China, and other lands, the union has throughout its existence led the way in developing the movement.

About the middle of the 19th century the international uniform lesson courses prepared by a committee of American, Canadian, and British Sunday school leaders was adopted in all parts of the world. In 1902 reformed methods were introduced into Great Britain by the Sunday School Union. One

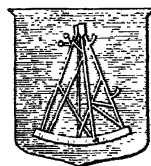
result was the issue of graded lesson material designed for (a) beginners (3 and 4 years); (b) a primary department (5 to 7 years); (c) a junior department (ages 8 to 10); (d) a senior department (up to 13); and (e) young people (up to 16).

Since 1889 world conventions have been held at intervals, and as a result, at the Rome convention in 1907, the World's Sunday School Association was brought into being, having for its aim the development of the Sunday school in those countries most in need of help. In England the National Sunday School Union has its headquarters at Windsor House, Victoria Street, London, S.W.1.

Sunday Times. London newspaper. Founded 1822, it is recognized as one of the two "quality" Sunday journals in the U.K., the other being *The Observer*. To its pages devoted to criticism of literature, drama, music, art, etc., such writers as Desmond McCarthy, James Agate, Ernest Newman, and Ralph Straus have been regular contributors, and the political articles by "Scrutator" (Herbert

engines, could carry 4,000 lb. payload and crew over a normal range of 1,780 m. The heavy armament included three power-operated turrets. See *Aeroplane illus.*, p. 130.

Sunderland. Mun., co., and parl. bor., seaport, and largest town of Durham, England. It



Sunderland arms

stands at the mouth of the Wear, 12 m. S.E. of Newcastle-upon-Tyne, and is served by rly. The chief buildings are the town hall, opened 1890; public library, museum, and art gallery, 1879; and legal buildings, 1907. There are several parks and recreation grounds. The oldest church is S. Peter's, Monkwearmouth (part 7th century). The bor. includes Bishopwearmouth and Monkwearmouth, on either side of the Wear, which is crossed by the Queen Alexandra bridge opened in 1909 and the Wearmouth bridge opened in 1929. Roker is a seaside suburb.

With the development of the Durham coalfield in the 19th century, Sunderland became one of the biggest shipping and shipbuilding towns in the world. The harbour is enclosed by two stone piers and the docks can accommodate the largest vessels. They

cover over 200 acres, and coal is the chief article of export. Other industries are marine engineering, glassmaking, and the production of pit props, furniture, and paper. The oldest parts of Sunderland are Monkwearmouth and Bishopwearmouth; there was a famous Benedictine monastery at the former. Wearmouth, as it was called, became a port, but Sunderland, the name of a third parish, was given to the borough on its incorporation in 1634. Two M.P.s are elected. The worst air raids in the Second Great War were in 1943, on March 14 and 15, May 16 and 24; 267 persons were killed, 1,000 injured, and 34,500 houses damaged. Pop. est. 180,130.

Sunderland, EARL OF. English title granted to the family of Spencer in 1642. His great grandson, the 5th earl, became duke of

Marlborough in 1733; and all succeeding dukes have been also earls of Sunderland. See Marlborough, Duke of.

Sunderland, ROBERT SPENCER, 2ND EARL OF (1640-1702). English statesman and courtier. Born

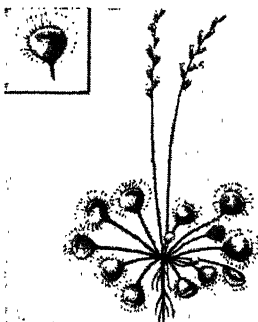
in Paris, Aug. 4, 1640, son of Henry Spencer, 1st earl of Sunderland, who was killed at Newbury, 1643, and educated abroad and at Oxford, Sunderland throughout his career showed himself to be



2nd Earl of Sunderland, English statesman After Carlo Maratta

an intriguer, treacherous, profligate, and rapacious. After holding several diplomatic appointments, he became secretary of state, 1679, and one of the small cabal that surrounded Charles II. Sunderland supported James II in his actions, while at the same time maintaining secret relations with William of Orange. On James's fall he went to Amsterdam, but in 1691 declared himself a Protestant, and soon regained his old power. He was lord chamberlain, April, 1697, but resigned in Dec. Sunderland died at Althorp, Sept. 23, 1702.

Sundew (*Drosera rotundifolia*). Perennial insectivorous herb of the family Droseraceae. A native of Europe, N. and W. Asia, and N. America, it is a small rosette-plant growing in boggy ground. Its long-stalked leaves have a circular blade studded with crimson threads. Glandular at the tips, they secrete a gummy fluid. The flower spikes are 4 to 6 ins. long, and bear two rows of small white flowers which open only in sunshine, and the leaf-glands are extremely sensitive to the touch of any organic matter. Insects, at-



Sundew. Flower spikes and tentacle-fringed leaves: inset, single leaf



Sunderland, Durham. The Wearmouth bridge, opened by the duke of York (King George VI) in 1929

Sidebotham) were for many years a strong feature. Lord Camrose (g.v.) was editor-in-chief from 1915 to 1936, during which time he and his brother, Lord Kemsley, were joint proprietors. The former gave up his interests in Jan., 1937.

Sunderland. British flying-boat, designed and built by Short Bros., Ltd. The largest R.A.F. aeroplane in operational service throughout the Second Great War, the Sunderland was developed for general reconnaissance from the commercial Empire or C class boat (used by Imperial Airways, and later by the B.O.A.C.), and itself formed the basis for the 58-ton Shetland and post-war Seaford, Solent, and other notable flying-boats. The standard Sunderland had a wing span of 112 ft. 9½ ins., and, powered by four 1,065-h.p. Bristol Pegasus radial

tracted by the dewy appearance of the glands, set up irritation by their efforts to get free from the viscid fluid which holds their feet. The tentacles all converge to the prisoner; the margins of the leaf curve towards the centre, forming a hollow into which a fluid is poured in which the insect is digested and the product absorbed. There are about a hundred species, three British. See Bog Plants.

Sundial. Instrument for measuring time. It makes use of the motion of the sun's shadow which is cast on to a flat surface by an iron style or gnomon arranged to be parallel to the earth's axis. The surface or dial plane, which is

seen most frequently at the same elevation as the sun and lying on or near the ordinary halo ring. There is some doubt as to how the name has arisen, for although the mock sun must follow the real sun as a dog its master, sun dogs persist for only short periods at a time. See Halo; Mock Sun.

Sundsvall. Seaport of Sweden. in the län or co. of Vesternorrland. It is on a sheltered inlet of the Gulf of Bothnia, 29 m. S.W. of Hernösand. It has an extensive timber trade and manufactures wood pulp, iron, and steel. There are shipbuilding yards. The town was rebuilt in stone after a disastrous fire in 1888. Pop. 19,142.



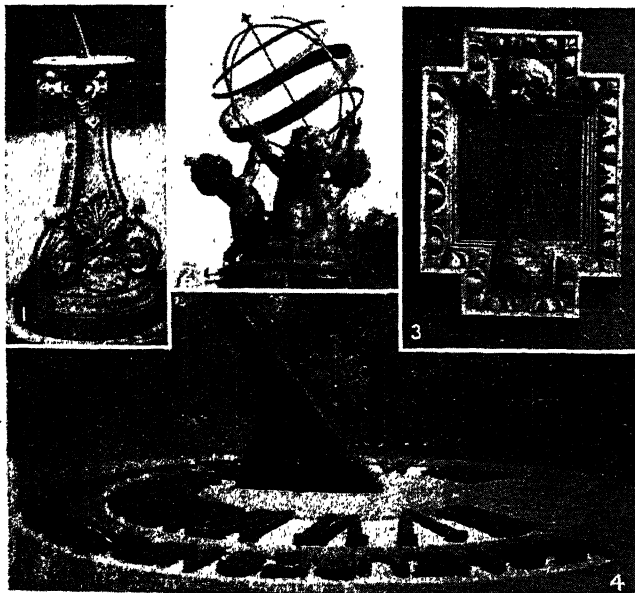
Sunflower. Large flowerheads and leaves of the tall garden plant

which are valuable as poultry food and as a source of oil. They are easily grown in any good garden soil, the seeds being sown in March. The genus *Helianthus* includes 55 species, all American, many of them perennials. Several other species are cultivated in Britain, including *H. tuberosus*, the so-called Jerusalem Artichoke (*q.v.*), which is not an artichoke and has no connexion with Palestine.

Sungar or **DZUNGAR.** Nomad tribe of Kalmuk stock in Central Asia. The left wing of the W. Mongols, they dominated in the 17th century the N. Tian Shan watershed, and established the widespread and powerful Sungarian kingdom.

Sungari. Tributary of the Amur, China. It rises in the White Crested Mountain on the borders of Korea, at an alt. of 8,000 ft., and flows N.W. until it receives the Nonni, which drains N.W. Manchuria, and then N.E. past Harbin. It is navigable to Kirin during half of the year. Length 800 m.

Sungaria. Region of China and Russia between the Tian Shan and Altai Mts., alternatively known as Zungaria (*q.v.*).



Sundial. Examples from English country houses. 1. Pedestal sundial, Ditton Park. 2. Copped Hall, Essex. 3. Wall pattern, Fairlawne, Tonbridge. 4. In yew and box, Easton Lodge, Essex

firmly fixed to a wall or pillar, and which is sometimes horizontal, sometimes vertical, bears marks showing the hours, half-hours, etc., of the day, the observer telling the time by noticing where the shadow falls. A device of great antiquity, it was in general use as a time-keeper before the invention of clocks and watches. Some sundials were very elaborate, notable examples extant being those at Queens' College, Cambridge, and Corpus Christi College, Oxford. Many bear Latin mottoes, referring to the brevity of human life. See Time; consult also Book of Sun Dials, Mrs. A. Patty, 1900.

Sun Dog. Term popularly applied to a mock sun, i.e. the image of the sun, often coloured, which is

Sun Fish (*Mola*). Genus of large fishes. They are notable for their very short and laterally compressed bodies. The depth of the fish is almost equal to the length, so that its outline approaches a circle. The rough sun fish (*M. mola*) occasionally occurs in the British seas, and is sometimes as much as 7 ft. long.

Sunflower (*Helianthus annuus*). Tall annual herb of the family Compositae, native of N. America, whence it was introduced to British gardens in 1596. It has a stout stem, 6 ft. or more in height, with large, rough, alternate oval leaves and huge flower-heads with deep-yellow ray florets and a broad brown disk. Each head produces hundreds of large grey seeds,



Sun Fish. Round marine fish that sometimes attains a length of 7 ft. American Museum of Natural History

Sungkiang. One of China's nine N.E. provinces. It contains 21 counties with Mutankiang as its capital. Other important cities are Acheng, Harbin, and Hohsi. The Changchun rly. runs through the province. Chief products are soya bean, kaoliang, millet, and timber. The province consists of fertile plains in the W., and hilly regions with valuable forests in the E., where it borders the U.S.S.R. Area, 30,703 sq. m. Pop. 4,923,000.

Sun Helmet or SOLA TOPEE. Head covering formerly worn by Europeans in tropical countries. Constructed of some light insulating material such as sola pith, with the outer surface of a light colour, it was superseded in the Second Great War and after by the bush hat.

Sunium (Gr. *Sounion*). Ancient name of the rocky promontory at the S. end of Attica, Greece. On its highest point (200 ft.) are the ruins of a temple of Poseidon, dating from about 450-400 B.C. The temple of Athena, with which this was formerly identified, was a little distance away to the N.E. The modern name of Sunium is Cape Colonna.

Sunn Hemp (*Crotalaria juncea*). Annual herb of the family Leguminosae. A native of India, it has downy, furrowed stems, and lance-shaped leaves clothed with silvery-white hairs. The yellow flowers resemble those of the broom, and form long sprays at the end of the branches. They are succeeded by pods containing kidney-shaped seeds. The name is due to the valuable fibres derived from the inner bark.

Sunni (Arab., lawful). Name denoting orthodox Mahomedans, because they accept as their rule of faith and law the Sunna and the Koran. The Sunna deduces the standpoint and usage of Mahomet from his hadiths or traditional sayings and doings. Islamic theology and law were founded by Hanifa at Kufa, Malik at Medina, Shafi at Cairo, and Hanbal at Bagdad. All Sunnites, while recognizing the authority of the six collections containing the Sunna, which were compiled in the 9th century, follow one of the above four systems. The Hanafite prevails among Turks, Tartars, Iraq Arabs, and Indian Muslims; the Malikite mostly in Africa; the Shafite in Arabia and Persia; the Hanbalite is local and unimportant.

Acknowledging the first four caliphs after Mahomet as validly elected, Sunnites regard the authority of the caliphate as political

rather than spiritual. This distinguishes them from the Shiahs, mostly in Persia, who maintain that the Prophet's true and divinely appointed successor was his son-in-law, Ali. The Sunnis number some 200,000,000. See Mahomedanism.

Sunningdale. Village of Berkshire, England. It is 27 m. by rly. W. of London, and has excellent golf links. At Sunningdale Park the Civil Defence staff college was opened 1950. Sunninghill near by has an old church and a rly. station (Sunninghill and Ascot). Sunninghill Park, built c. 1770, and bought by the commissioners of crown lands in 1944, was granted Aug. 14, 1947, to Princess Elizabeth by her father George VI as a "grace and favour" residence, but was too seriously damaged by fire Aug. 29 for occupation.

Sun Pillar. Vertical column of light, usually a glittering white but occasionally yellow-orange or red, seen above (and sometimes below) the sun, especially about sunrise or sunset. The phenomenon is attributed to the reflection of sunlight from small snow crystals. Should a sun pillar be visible at the same time as the mock sun ring, the striking phenomenon of the cross may be produced in the sky. See Mock Sun.



Sunshine Recorder. Instrument of the Campbell-Stokes pattern
By courtesy of Negretti & Zambra

Sunshine. Term applied to the radiation from the sun which renders objects visible to the eye. It extends over a range of wavelengths from about 0.4 to 0.8 micron, the former being violet and the latter red light; between these limits are the remaining rainbow colours, viz. indigo, blue, green, yellow, and orange. Outside the earth's atmosphere the violet light is far more intense than the red, but the shorter waves are more readily scattered by the atmosphere than the longer ones; hence at the earth's surface the distribution of

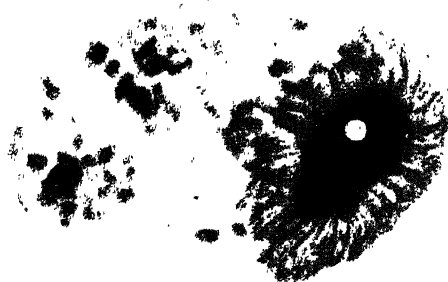
energy is altered, so that when the solar beam has to traverse a long path, e.g. at sunset, through a dusty atmosphere, radiation in the longer wavelengths so predominates that red is the principal colouring. The loss in the solar radiation at wavelengths of less than 0.4 micron, i.e. ultra-violet rays, is even more pronounced, which explains the choice of mountain sanatoriums for therapeutic treatment.

The duration of bright sunshine is an important meteorological element and can be ascertained by the aid of a suitable device such as a sunshine recorder (*v.i.*). In Great Britain there is more sunshine on the coasts than inland, and the sunniest month in most places is June; the duller everywhere is Dec. The smoke of industrial areas reduces the sunshine, e.g. in central London the mean daily value is about 3.6 hours, while at Kew and Enfield, on the outskirts, it is 4.0 hours; this deficit is equivalent to about 150 hours over the year. The sunniest region is the S. coast of England, some parts of which record annual totals in excess of 1,800 hours. In contrast, in parts of S. Africa 3,000 hours are frequently registered, e.g. Kimberley (mean 9.4 hours per day) registers 85 p.c. of the possible sunshine in June. See Radiation.

Sunshine Recorder. Instrument for recording the duration of bright sunshine. The one commonly adopted is the Campbell-Stokes. In this instrument an accurately made glass sphere, four inches in diameter, focuses the sun's rays upon a strip of cardboard mounted in a metal bowl, approximately spherical in shape. As the sun passes from E. to W., its focused rays burn a line in the cardboard during the periods of bright sunshine, and as the cardboard is graduated in hours and tenths, the daily duration of sunshine can readily be determined.

In the N. hemisphere the recorder is set to face due S. and so that a line through the centres of the sphere and the metal bowl makes with the horizontal plane an angle equal to the latitude of the place of observation. See Sunshine.

Sunspot. Dark spot which makes its appearance on the sun's photosphere. Many spots may appear at one time on the sun's disk, and are carried round by the sun's rotation. They are not uniformly dark, but consist of an outermost penumbra, a darker inner shade, the umbra, and a central dark



Sunspot. Photograph of a sunspot, taken with a telescopic lens. The white spot in the centre shows the relative size of the earth

spot, the nucleus. Sunspots are chiefly confined to the middle latitudes, are never seen near the poles, rarely on the sun's equator.

Some cover millions of square miles, and last for months; others are visible only by powerful telescopes, and are of short duration. The number and size of sunspots vary cyclically every 11 years. At periods of maximum activity, e.g. 1937, 1947, over one thousandth of the sun's disk is on the average covered by spots, whereas at minimum, e.g. 1933, 1944, the area covered is usually only a small percentage of this. Sunspots or associated disturbances are often responsible for magnetic storms and radio disturbances, but no connexion with the weather has been proved. Experiments with radio waves show, in general, an abnormal increase in the ionisation of the E-layer during magnetic activity. Sunspots appear dark because they are about 2,000° C. cooler than the rest of the photosphere. They are the seat of intense magnetic fields, but their cause is unknown. See Sun.

Sunstone. Form of translucent adularia (var. feldspar), emitting a brilliant red metallic glitter from the background, like hidden fire, caused by the presence of innumerable minute inclusions of ilmenite, limonite, etc. It is classed as a semi-precious gem-stone, and is cut with a flat or slightly convex surface.

Sunstroke OR **HEATSTROKE.** Condition due to high air temperature, particularly when associated with a high degree of humidity of the air. The condition is most frequently seen in India and other tropical regions, but cases also occur in Europe in the summer. Heatstroke is more common among children than among adults. The predisposing causes are physical exhaustion and heavy clothing; hence it is often seen among soldiers during long marches. The

ease is due to the action of heat on the cerebro-spinal nervous system. The earliest indications are usually headache, drowsiness, weakness in the legs, and sometimes nausea. The acute condition begins with a sudden rise of temperature to 104° F. or more, and may often reach 110° F. The patient becomes unconscious and sometimes delirious.

In favourable cases the temperature falls rapidly, and recovery quickly occurs, but sometimes the fever persists for 8 or 10 days. After an attack the individual is particularly susceptible to high temperatures for a long period. The death rate varies from 15 to 25 p.c. Treatment consists in loosening the patient's clothing at once and taking him to a cool place. An ice-bag should be applied to the head, and the body sponged with cold water. When the temperature falls to about 101.6° F., the sponging should be stopped and the patient wrapped up in blankets, heart stimulants being probably necessary.

Sun-Worship. Ritual expression of reverence for the sun as the source of beneficent light and heat. In primitive culture the solar orb is the supreme deity, a coordinate or subordinate member of a pantheon, or a divine symbol or abode. It received direct adoration or was associated with a shrine, sometimes containing perpetual fire, a mirror, a disk, or an image in human form.

The cult of the sun is primeval, and some observances owe their dispersion to early migrations. It appealed especially to peoples practising settled agriculture in non-torrid regions. Sun-worship in early Egypt, perhaps perpetuating Neolithic traditions, became associated with a disk or a bark. Its widespread influence is shown by Bronze-Age rock-carvings and votive objects in Scandinavia. In 1921 the Egyptian Survey disproved the theory that the axis of

heavy topee and spine pad are now no longer used, having been recognized as the cause, not the preventive, of sunstroke. In tropical countries, Europeans are more affected than negroes or Indians, and those of blond colouring are more vulnerable than darker persons. Pathologically, the dis-

ease is due to the action of heat on the cerebro-spinal nervous system. The earliest indications are usually headache, drowsiness, weakness in the legs, and sometimes nausea. The acute condition begins with a sudden rise of temperature to 104° F. or more, and may often reach 110° F. The patient becomes unconscious and sometimes delirious.

In aboriginal America sun-worship is related to the immigrant influences which affected the civilizations of Mexico and the Andean tablelands, where the Inca rulers, the people of the sun, established it as a state religion. Among the Cherokees, as in Japan and ancient Yemen, the sun is a goddess. The annual sun-dance of the plains Indians was attended by the fulfilment of vows.

The sun-god Surya of Vedic India, whose veneration still governs Brahman practice, and the Persian Mithra, are correlated with the Greek Helios. The sun-temples of Konarak, Gaya, and Martand witness to a widespread worship anterior to conventional Hinduism. This Aryan cult may have absorbed pre-Aryan elements, which survive in central Asian shamanism, among the aboriginal tribes of S. India, and in Japan. See Akhnaton; Amen-Ra; Shamash; *consult also* The Sun and the Serpent, C. F. Oldham, 1905.

Sun Yat-sen (1866-1925). Chinese statesman. Born near Canton, and educated in the American university at Hawaii, he graduated in medicine at Hong Kong. In 1893 he became a political agitator, leading the fruitless Canton rising of 1895. For some years he was a refugee, in Japan, England, and the U.S.A., all the time organizing the revolutionary party which rose to arms in 1911 and deposed the Manchu dynasty. Sun Yat-sen became provisional president of the Chinese republic, but resigned the following year in favour of Yuan Shih-kai whose election brought in the whole of N. China to the republic. His opposition to Yuan's policy brought him into disfavour, however, and he retired to Japan, where he organized the revolts of 1912 and 1915.

In 1917 the S. states of China declared a military government of their own at Canton. Sun Yat-sen was elected president, civil war followed, and on the defeat of his army Sun resigned. In 1921 he made a successful bid for power,



Sun Yat-sen,
Chinese statesman

being elected president of the Canton government. Failing in an attack on Peking, he took refuge in Shanghai, 1922, but in 1923 re-established himself at Canton. After his death, March 12, 1925, he became an object of veneration among his fellow countrymen as the "father of his people." He married one of the Soong (*q.v.*) sisters. *Consult* Teachings of Sun Yat-sen, N. Gangulee, 1945.

Superannuation. Form of pension payable to employees in public services, industry, and commerce; generally, contributions are paid by both employee and employer during the whole of the former's service. The pension becomes payable when the employee reaches a prescribed age, usually not less than 60. *See* Pension.

Supercharger. Device for increasing the pressure of air supplied to an internal combustion engine. Normally such engines rely upon the pressure of the atmosphere to force the mixture into the cylinders so that it follows the receding piston during each down or suction stroke. In engines running at high speed, as on racing cars, filling the cylinders becomes difficult owing to the brevity of each induction stroke and the limited force which can be exerted by the ordinary atmospheric pressure of 15 lb. per sq. in. A typical supercharger consists of two figure-of-eight rotors enclosed in a casing and geared to run in opposite directions at the same speed, the power for their movement being derived from the car engine. Air or mixture entering one side of the casing is carried round the curved walls and forced out by the rotors to the cylinders. A positive pumping effect is thus produced and mixture supplied to the engine at a pressure substantially higher than atmospheric. Increase in pressure through superchargers on road vehicles may be 30 lb. per sq. in. High altitude aircraft engines require superchargers because of the lack of oxygen in the air at great heights. *See* Internal Combustion Engine.

Supercooling. In physics, cooling of a liquid to a temp. below its normal freezing point without solidification. If cooling is slow, a temp. is reached when solidification begins, and when the latent heat may be sufficient to raise the temp. back to that of the normal freezing point. The degree of supercooling is markedly influenced by the viscosity of the liquid, and viscous liquids, *e.g.* glass, can be supercooled to such

a degree that normal crystallisation is entirely suppressed. The phenomenon plays an important part in meteorology, hail, rime, and frost all depending upon its occurrence.

Super-Ego (*Lat. super, above; ego, I*). Term used by psychoanalysts instead of conscience. The function of the super-ego is to keep in check those primitive impulses which the individual regards as bad. It is held to operate by drenching the mind with anxiety when the ego feels in danger of giving way to one of these impulses. This anxiety may change to remorse and humiliation if the super-ego is defied and the forbidden act performed. Memories of these unpleasant feelings may aid the super-ego in its task when a conflict of the same type again arises. It does not, however, as conscience is supposed to do, tell us what is right or wrong, moral values depending upon moral codes, which are established in various ways, but particularly by what the child believes to be his parents' attitude. This limitation of the functions of the super-ego is one of the reasons which have led psychoanalysts to abandon the word conscience.

Supererogation, WORKS OF (*Lat. supererogare, to pay beyond what is expected*). Theological term of the R.C. Church for such good works as a man may do over and above those required for the health of his soul. These works of supererogation, performed by saints and other godly men and women, help to form the treasury of the Church, already enriched by the superabundant merits of Christ, and from this fund the Church draws for the relief of contrite sinners and of souls in purgatory. *See* Indulgence.

Superfortress. Name given to the B-29, a heavy bomber built by the Boeing Aircraft co. for the U.S.A.A.F. The largest bomber used during the Second Great War, the Superfortress was a development of the B-17 or Flying Fortress (*q.v.*). It was expressly designed for long-range operations over the Pacific, its maximum non-stop range being more than 5,000 m. Maximum bomb load was 20,000 lb., but the aircraft did its deadliest work as the carrier of the two atomic bombs dropped on Hiroshima and Nagasaki, and of the incendiaries that fired Tokyo and other Japanese cities. The wing span was 141 ft. 3 ins., the length 99 ft. The four engines

were: in the B-29, 2,200 h.p. Wright Duplex Cyclone radials; the B-50, a development of the B-29, had 3,350 h.p. Pratt and Whitney Wasp Majors. The commercial transport version of the Superfortress was called the Stratocruiser. *See* Aeroplane illus., p. 131; Stratosphere.

Supergene. Changes in minerals and rocks caused by the influence of descending oxidising surface waters, such solutions being known as supergene solutions. The rich oxidized zones of copper and lead deposits are a result of these processes. *See* Hypogene; Ore Deposit.

Superheater. Device for superheating steam, *i.e.* for raising its temperature after it has left a boiler, or is no longer in contact with water.

The following is a description of one of the most efficient types of superheater applied to rly. locomotives: A number of the ordinary boiler tubes are omitted, their places being taken by 18 to 24 tubes of much larger diameter. The steam pipe from the boiler discharges into a chamber within the smoke-box, whence the steam is conveyed through tubes, contained in the large tubes above referred to, with return bends, and delivered into another pipe in the smoke-box through which it passes to the cylinders. The great heat passing through the big tubes raises the temperature of the steam to 400-600°. *See* Boiler; Steam Engine.

Superheterodyne. Type of radio receiving circuit in which the received radio-frequency voltage is combined with a voltage from a local oscillator and converted into a voltage of a lower or intermediate frequency. This voltage is then suitably amplified and afterwards detected to reproduce the original signal wave. The receiver is regarded as giving a better performance than any other type developed in the 1940s.

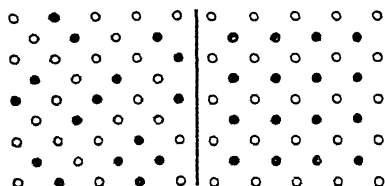
Superior (*Lat. super, above*). Upper or higher, something above. It is used as a noun for the head of a religious house or other ecclesiastical society, *e.g.* father superior and mother superior. In Scots law a superior is one who makes a grant of land in return for a fixed yearly payment called a feu duty.

Superior. Largest lake in the world. It is the most westerly of the Great Lakes of N. America, and separates Canada from the U.S.A. Its shores extend 1,500 m., and its area is 31,800 sq. m. It is 354 m. long, 162 m. wide, 601 ft. above sea level, and 1,008

ft. deep, and forms the largest reservoir of the St. Lawrence river and discharges into Lake Huron by the St. Mary. Except for the sand dunes of the S.E. the shores are, in general, bold and rocky. Only the shore waters freeze; during storms waves of 15 to 18 ft. occur. There are deposits of iron, silver, and copper ore close to the lake. See Great Lakes.

Superior. City of Wisconsin, U.S.A., the co. seat of Douglas co. A port of entry, it stands at the mouth of the St. Louis and Nemadji rivers at the W. end of Lake Superior, and is served by the Northern Pacific and other rlys. Superior shares a vast harbour with its neighbour, Duluth, behind which lie great, but diminishing, iron deposits and coal. Ice prevents navigation for about five months of the year. Founded in 1853, Superior became a city in 1889. Pop. 35,136.

Superlattice. Crystal structure of a solid solution in which the atoms of the various elements take up orderly positions in the crystal lattice. An example of superlattice formation occurs in



Superlattice. Plan view of body-centred cubic lattice containing atoms of two elements A and B arranged in disordered (left) and ordered (right) form. Open circles represent atomic centres of element A, and solid circles atomic centres of element B. See text.

copper-zinc alloys containing 39 to 59 p.c. of zinc by weight. These alloys normally contain a crystalline phase, called β , in which the copper and zinc atoms are arranged in a body-centred cubic lattice. Above a certain temp. (454 to 468° C., depending on the zinc content), the copper and zinc atoms are arranged at random and in a disorderly manner in the body-centred cubic lattice, but below this temp. a superlattice is formed by the copper and zinc atoms ordering themselves so that the body-centred cubic structure consists of interpenetrating simple cubic lattices of either copper or zinc atoms. The diagram shows a plan view of the body-centred cubic lattice in the disordered and ordered, or superlattice, forms. See Lattice; Solid Solution; Solution.

Superman (Lat., *super*, above; Ger. *Übermensch*). Term first

brought into prominence by Nietzsche. It is applied by him to an imaginary superior human being, conscious of his own irresistible strength, and unrestrained by religious, moral, social, or political considerations in the exertion of it to the full.

Supermarine. British aircraft works, from 1928 a branch of the Vickers concern. At first Supermarine concentrated on seaplane design, producing standard R.A.F. flying-boats such as the Southampton and Scapa; amphibians, notably the Walrus (*q.v.*), for naval use; and the S.5, S.6, and S.6B, successful in the races for the Schneider Trophy (*q.v.*). The chief designer of these racing aircraft was R. J. Mitchell (*q.v.*), who afterwards entered landplane designing with the Spitfire (*q.v.*), a first-line fighter throughout the Second Great War. After the war appeared the generally similar Spitfire, as well as several jet-propelled types of military fighter craft.

Superphosphate. Fertiliser for the soil. Phosphates being insoluble are not absorbed by plants, but phosphate deposits treated with sulphuric acid are converted into soluble acid phosphates or superphosphates. The idea originated with Liebig, who recommended the treatment of bone ash, which consists mainly of calcium phosphate, with sulphuric acid to make a soluble phosphate. J. B. Lawes (*q.v.*) in 1842 improved on this by employing mineral phosphates.

Super-saturation. Term used in chemistry. The amount that one substance can contain of another in solution depends upon the substances, temperature, and pressure, and is limited. When the limit is reached, the solution is said to be saturated. A solution is said to be super-saturated when it contains a larger amount of a substance than the normal limit without precipitation. Super-saturated solutions are in unstable equilibrium, and crystallisation may occur suddenly throughout if a suitable nucleus, *e.g.* a small crystal of the solute, is inserted.

Supersonics. Term which formerly meant the study both of phenomena concerned with bodies moving with speeds greater than the velocity of sound, and of the effects of vibrations at frequencies above the limit of audibility, the latter now called ultrasonics (*q.v.*).

When a body is moving with a speed greater than the speed of sound, the air compression created by its motion can be transmitted only in a lateral direction. An interesting result is that if high velocity projectiles are passing overhead or near at hand, the whine of the shell is first of all heard, then its explosion, and lastly the firing of the gun. The order of the last two sounds may be reversed if the explosion occurs at a distant place. As supersonic speeds are approached the medium exhibits compressibility effects; the Mach number then becomes the important factor in such conditions. The Mach number is defined by the ratio v/c where v is the velocity of the body and c that of sound.

Superstition (Lat. *super*, above; *stare*, to stand). Term used for any religious or kindred belief which those not holding it regard as false or silly. The religious practices of primitive races, *e.g.* rain-making, are generally thought to fall under this designation, as are practices such as witchcraft. Some popular modern superstitions, *e.g.* touching wood for luck, sitting thirteen at table, have been traced to more or less remote religious practices, but there is no certainty as to their origin. See Folklore; Magic; Witchcraft.

Super-Tax. A second tax levied in the U.K. on incomes above a certain level. It was originally introduced by Lloyd George in the budget of 1909, and was then imposed only on those whose incomes exceeded £5,000. Later chancellors reduced the level at which it became payable. In 1929 super-tax, which was then levied on a graduated scale on all incomes exceeding £2,000, was replaced by surtax (*q.v.*).

Supertonic (above the tonic). Second degree in a major or a minor scale of music, *e.g.* D in the key of C.

Suppé, FRANZ VON (1820–95). Austrian composer. Really named Francesco Cavaliere Suppé Demelli, he was born at Spalato (Split), April 18, 1820. He began to compose at 15, and settling in Vienna, became conductor of theatre orchestras there. He died May 21, 1895. None of Suppé's 49 operettas is remembered in Great Britain, though *The Country Girl*, 1847, had a success there in the 19th century; but his lively overtures, *Light Cavalry*; *Poet and Peasant*; *Pique Dame*; *Morning, Noon and Night* in Vienna, are very popular.

Supple-Jack. Name applied to certain climbing shrubs on account of their tough and flexible stems. Notable are species of *Paullinia*, also *Cardiospermum grandiflorum* and *Berchemia scandens*.

Supply. Word meaning the provision of anything, *e.g.* the food of an army or the materials for a factory. In parliamentary speech it refers to the provision of money by the house of commons for the navy, army, and other public services. Early in each year the house becomes a committee of supply, and as such considers the estimates for the various departments. In Scotland officials called commissioners of supply collected the money necessary to carry on the business of the various counties. *See* Parliament.

Supply, MINISTRY OF. British govt. department set up in April, 1939, to direct and coordinate the production of munitions. Its preparatory work made possible the comparatively smooth transition of the nation's industries to military production during the Second Great War. The ministry was originally concerned solely with the purchase of army requirements, but eventually became responsible for supplying munitions, equipment, and clothing to the fighting services. It advised on weapon and vehicle design and placed contracts. After the war it managed industrial controls and was the authority for development of atomic energy in Great Britain.

Supply and Demand. Theory in economics according to which prices are regulated by the amount or number of commodities available for sale, and by the actual demand for such commodities. If the demand appreciably exceeds the supply, buyers will, in competitive conditions, offer higher prices, whereas if there is a considerable over-supply of an article, prices will drop. These changes operate in either direction until comparative stability is reached. The theory is applied by some economists to labour, and the relation of supply and demand certainly influences rates of wages. *See* Economics; Labour.

Supporter (Lat. *sub*, up; *portare*, to carry). In heraldry, supporters are representations of human beings, animals, fabulous creatures, or, rarely, inanimate objects. They are placed on both sides, one side, or at the back of an armorial shield, seeming to guard or uphold it. In English heraldry, supporters are restricted to the sovereign, princes of the blood, peers and their heirs,

those holding special grants, and a few families using them by the prescriptive right of long usage. In Scotland, baronets of Nova Scotia long claimed the right to use supporters, and the heads of clans and feudal lordships commonly do so. In grants of arms to corporations supporters have been generally adopted. *See* Heraldry: col. plate.

Suppository. Conical solid body composed of a basis of oil of theobroma, with an active medicament, intended to be introduced into the rectum or vagina. Suppositories of glycerinated gelatine are also in use.

Suppuration (Lat. *sub*, under; *pus*, matter). Formation of matter or pus within the tissues of the body. It is due to infection by micro-organisms. Local treatment is governed by the stage of the inflammation. Penicillin and the sulpha drugs have proved helpful. *See* Abscess; Blood Poisoning; Inflammation; Phagocytosis.

Supra-renal Gland OR ADRENAL GLAND. Small ductless gland situated on the upper part of each kidney. It forms a secretion called adrenalin, which is passed into the blood in small quantities, and has a function in maintaining the muscular tone. When adrenalin is injected into animals or applied locally, it causes a powerful contraction of the blood-vessels, and for this reason a solution is used in surgery to arrest haemorrhage, combat shock, or allay itching. Adrenalin also stimulates the liver to discharge more sugar into the blood, and thus increase the sources of muscular energy. Adrenalin for such purposes is usually prepared synthetically.

Adrenalin plays an important part in the defence of an organism. Under the stimulus of the emotions of fear or rage, an abnormal quantity of the secretion is passed into the system. The result is that the body is thrown into a state of defence, or of capacity to flee (the lion is prepared for attack, the deer for flight), the tone of the muscles is increased, and more energy is available for their action. The peripheral vessels are contracted, an effort of nature to provide important organs like the heart and lungs with adequate blood. Tubercle attacking the supra-renal gland leads to the disorder known as Addison's disease (*q.v.*). Nicotine stimulates these glands; hence addiction to the use of tobacco.

Supremacy, ROYAL. Term applied to the prerogative claimed by the crown of England to be "the

only supreme head on earth of the Church of England." By these words the Act of Supremacy, 1534, repudiated the papal claim of spiritual jurisdiction in England. The Act was repealed by Mary, 1554, but came again into force under Elizabeth, who defined the royal supremacy as being the sovereignty over all persons, ecclesiastical or temporal, "so as no other foreign power shall . . . have authority over them." On many appointments to public office in the U.K. an oath of allegiance and acknowledgement of the royal supremacy is required.

Supreme Council. Allied organizations during and after the First Great War. The first was set up after the disaster of Caporetto (*q.v.*) in Nov., 1917, under the name supreme war council, and met at Versailles. Consisting of political and military representatives of the Allied countries, its object was to coordinate their military and other war plans. It disappeared in March, 1918.

The second council grew out of the executive of the Allied delegates at the Paris peace conference, 1919. After the signing of the treaties of Versailles, St. Germain, Sévres, etc., its function was to enforce their terms. Conferences took place at Paris, San Remo, Cannes, and elsewhere. The council's work clashed with the functions of the League of Nations (*q.v.*), and much criticism was directed against the frequency of its meetings, and its inability to restore settled conditions to Europe. It was then an assembly of the British, French, and Italian premiers, foreign ministers, with financial and military advisers.

When the Second Great War broke out, a supreme war council, consisting of the French and British premiers and their military and naval advisers, was set up to coordinate Allied strategy. It held meetings in London and Paris, but ceased to function after the capitulation of France.

Supreme Court of Judicature. Chief court of law for England and Wales. It was established in its present form by an Act of 1873, when various courts of law were united under this name. It is divided into two parts, the high court of justice and the court of appeal. The judges of the high court of justice are the ordinary judges—or justices, their more correct title. Other officials are the masters, who hear cases of minor importance and deal with much preliminary and non-contentious

business, and there are also official referees and a taxing officer. Appeal lies from the high court of justice to the court of appeal, which is composed of the master of the rolls and lords justices; and from these there is a final appeal to the house of lords. The supreme court sits at the royal courts of justice, Strand, London, W.C.2. Canada and other countries have also a supreme court of justice.

The chief court of the U.S.A. is known as the supreme court. Its personnel consists of a chief justice and eight other judges who are appointed by the president with the consent of the senate. Each state also has its supreme court, from which there is an appeal to the supreme court at Washington. In addition to their business this court has original jurisdiction in cases affecting foreign ministers and consuls, and those to which the state is a party.

SURABAYA OR **SOERABAYA** (Du. Soerabaya). City of Java, Indonesia, at the mouth of the Kali Mas, on the N. coast. Strongly fortified and with a good harbour and a shipyard, it is the Netherlands naval and military headquarters in Indonesia. There is extensive trade in rice, coffee, cotton, sugar, tobacco, and copra. Petroleum is found in the vicinity. The main line of the state rlys. connects Surabaya with Jakarta by a single line 540 m. in length.

In the Second Great War, Surabaya was first bombed from the air by the Japanese Feb. 3, 1942, when installations were damaged, 31 were killed, 134 injured. Other raids followed, and air battles over the city between U.S. and Japanese aircraft. By March 7 Japanese land forces were besieging the city, which fell on March 10. Light Allied raids by long-distance aircraft on July 22 and Nov. 14, 1943, and March 15, 1944, were followed on May 17, 1944, by a heavy attack at dawn by British and U.S. carrier-borne planes, when 10 ships in the harbour were believed sunk; aircraft from Australia raided Surabaya again that night. All these raids took the Japanese by surprise, on account of the great distance of the port from Allied bases. The city remained in Japanese hands until the surrender of Japanese forces in the Netherlands Indies at Morotai, Sept. 9, 1945. A small group of British and Indian troops landed at Surabaya on Oct. 25, occupying the town and naval base without opposition. Fighting with nationalist extremists broke out, however, on Oct.

28, Brig. Mallaby, who went out to parley with them, being murdered. For a time Surabaya was in the hands of undisciplined armed nationalist rioters, but control of it was regained by the 5th Indian div., Nov. 29. Pop. est. 250,000. See Indonesia.

Suraj-ud-Dowlah (c. 1732–57). Nawab of Bengal. Grandson of Aliverdi Khan, whom he succeeded in 1756,



Suraj-ud-Dowlah,
Nawab of Bengal
From an Indian
miniature

he showed himself a ferocious and debauched tyrant. Indignant with the British for concealing one of his fugitive servants, he attacked Calcutta, June 18, 1756, and, after two days' siege, entered the city. Thereupon occurred the criminal tragedy of the Black Hole of Calcutta. Six months later Clive took Calcutta, Jan. 2, 1757. After his defeat at Plassey, June 23, Suraj-ud-Dowlah took to flight, but was captured and executed by his rival Mir Jafa on July 4. See Black Hole.

Surakarta OR **SOERAKARTA**. City of central Java, Indonesia. It is on the Solo river, and has rly. connexion with Semarang and Jokjakarta. In its centre is the fortress of Vastenberg. Pop. est. 100,000. See Java.

Surat. Dist. and town of India, in the Northern division, Bombay. The dist. fringes the coast on the E. side of the Gulf of Cambay. Cotton is the chief crop, and rice, native food grains, and pulses are grown. Area, 1,695 sq. m. Pop. 881,058. The town is on a seaport at the mouth of the Tapi, and was once the most populous city in India, the chief trading port, and the pilgrim port of Mecca. It was the first English settlement in 1613, and monopolised the cotton trade. In 1684 the headquarters of the East India co. were moved thence to Bombay, and the decline of Surat began. Pop. 171,443.

Surbiton. Borough of Surrey, England. It is 12 m. by rly. S.W. of Waterloo station. There are pleasant river bank promenades, an open-air swimming pool, recreation grounds, several churches, and a golf club. Pop. est. 60,859.

Surcharging. Literally, overloading and therefore overcharging. The word is specially used for the process by which members of local authorities are compelled to

pay for any illegal expenditure they have authorised. The surcharging is done by the auditors of the ministry of Health, but the liability can be removed by the ministry.

In another sense surcharging is equivalent to falsifying. In the chancery division, when accounts are taken, they may be taken by surcharging and falsifying. Surcharging means that items of credit, such as sums paid on account, have been omitted, thus making the total balance wrong. Falsifying means that particular items are wrong, being falsely or incorrectly charged either wholly or in part.

Surcoat. Outer tunic of a knight. It is said that Crusaders wore surcoats to veil their armour, which would otherwise become unbearably hot, from the intense heat of the sun. See Costume.

Surds. In algebra, numbers (roots) which cannot be expressed exactly as integers or as fractions, though they can be calculated as decimals to any desired number of places. The n th root of a quantity is such that when multiplied by itself $n-1$ times in succession it gives that quantity. Thus the fourth root of 16 is 2, since $2 \times 2 \times 2 \times 2$ equals 16. But the fifth root of 16 cannot be expressed as a commensurable number, and the fifth root of 16 is, therefore, a surd. The incommensurable square root, e.g. $\sqrt{5}$, is called a quadratic surd, and these are the most important types of surds. Surds obey the normal laws of algebra, e.g. $\sqrt{2} \times \sqrt{2} = \sqrt{4} = 2$. See Algebra.

Surety OR **GUARANTOR**. Person who undertakes to be liable that another shall perform an obligation. A surety may be described as one who promises to answer for the debt, default, or miscarriage of another, and the contract entered into by the surety is called a guarantee. If the surety is called upon to pay under his guarantee he is entitled to be refunded by the debtor whose obligation he has met. He is also entitled to demand from the creditor all securities held by the latter for the debt. Where there are several sureties, as between them and the creditor any one of them may be called upon to pay the debt. But as between themselves they must all contribute. So that if there are three sureties, and one pays the whole debt, he can compel each of the other two to pay one-third. See Guarantee.

Surface (Lat. *superficies*, upper side). That which has length and breadth, but no thickness: the

boundary between two regions of space. An infinite cluster of points makes up what is mathematically called a surface. The position of the points can be indicated in Cartesian coordinates (x, y, z); and the nature of the surface is fixed if the relationship of these coordinates to one another can be expressed as an equation. Thus, a general equation of the first degree, such as $lx + my + nz = p$, represents a plane, that is, a surface in which any two points can be joined by a straight line lying wholly in the surface; the equation, $\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$, represents an ellipsoid, a figure of which any plane section is an ellipse. If in the last equation $a=b=c$, the equation becomes $x^2 + y^2 + z^2 = a^2$, which is the equation of the surface of a sphere. A ruled surface is one through every point of which a straight line can be drawn so as to lie entirely on the surface; the straight lines lying upon it are called generating lines. The cylinder and the cone

Surface Hardening. The processes by which the surface of a soft and tough metal, usually steel or cast iron, is hardened, are described under Carburising; Case-Hardening; Nitriding.

Surface Layer. In physics, the boundary layer of a substance. This may often show a structural form different from that of the main body of the material. For example, when a solid body is polished the surface layer tends to flow and is known as the Beilby layer. This is of molecular dimensions in thickness and has been investigated by means of electron diffraction. There is some evidence that an appreciable surface effect exists in magnetic materials, made evident by an increased hysteresis loss for a given material when in thinner sheets.

Surface Tension. Property of a liquid in consequence of which its free surface tends to contract to a minimum area. It is explicable by the attractive force which molecules exert on one another at

by small floating bodies on the surface of a liquid are due to surface tension. Thus two small pieces of wood floating on water rush together when a short distance apart. This is because the water slightly raises itself upon each piece of wood, so that the two chips when close together form a wide capillary tube, and the pressure in the liquid between the chips is slightly less than outside them. A piece of wood, soaked at one end, will move steadily across the water as though propelled, since, as the soap dissolves, it alters the surface tension at one extremity of the wood. Small fragments of camphor, dissolving on the surface of water, dart about from a similar cause, the camphor, dissolving unequally on one side or the other, producing on alternate sides a liquid, the surface tension of which is less than water. Surface tension of an aqueous salt solution is greater than that of water. See Capillarity.

Surf Bird (*Aphriza virgata*). Species of bird which is found on the Pacific shores of America. It has brown and white plumage, and is related to the turnstones.

Surf-riding. Aquatic pastime. It was originally practised by natives of the Pacific islands, especially the Hawaiians and has become a familiar sport on the Pacific coasts of Australia and the U.S.A., and in a mild form in Great Britain. A flat board is placed on the water, and the surf-rider stands, kneels, or lies on it, and is carried landward on the crest of a breaking wave.

Surgeon. Word, a variant of *chirurgion*, for one who treats disease by manual operations. In the U.K. a surgeon must go through the same course of training as other medical practitioners. See Medicine; Surgery.

Surgeons, ROYAL COLLEGE OF. English surgical corporation founded in 1800. In the 14th century surgery was practised by two bodies, the Barbers' Company (*q.v.*) of London, and the Fellowship or Guild of Surgeons mentioned in the City records in 1369.



Royal College of Surgeons badge

From 1493 these two bodies, long keen rivals, acted together in matters relating to surgery, and were united from 1541 to 1745, when the surgeons were separately incorporated as the Company of Surgeons of London. In 1800 this



Surf-riding. Life-savers riding the waves at an Australian beach carnival

are examples of ruled surfaces. They can be generated by the movement of a straight line. See Ellipsoid; Geometry; Projection; Solid; Sphere. Consult Geometry of Three Dimensions, G. Salmon, 5th ed. 1912.

Surface, CHARLES AND JOSEPH. Characters in Sheridan's comedy, *The School for Scandal* (*q.v.*). They are two brothers. The elder, Joseph, presents himself as a "man of sentiment," deceiving himself and others by his extravagant moralisings, while in reality self-seeking and double dealing; while Charles is frankly a dissolute ne'er-do-well, but possessing great good humour and a heart of gold. It is Charles who sings the well-known song, *Here's to the maiden of bashful fifteen*. John Gielgud, playing Joseph in 1937, introduced a remarkable subtlety to his reading of the character.

short range. Surface tension is measured in dynes per cm. and ranges from a value of 465 for mercury to 73 for water and 29 for benzene at room temperatures. Surface tension decreases with temperature, and attempts have been made to link this temperature coefficient with the chemical constitution of a liquid. The total work done in increasing the area of a liquid surface by unity at constant temperature is known as the surface energy. This quantity is greater than the surface tension, for a liquid film cools on stretching and therefore energy has to be supplied to maintain the temperature constant.

A wineglass filled to the brim and actually overbrimming the glass, is a familiar example of surface tension. A soap bubble is another example. The apparent attractions or repulsions exhibited

was re-established as the Royal College of Surgeons of England, which received a charter in 1843.

The college possesses a fine building in Lincoln's Inn Fields, erected 1813, with a splendid library and the famous Hunterian Museum, which began with a collection of specimens made by John Hunter, and after his death was bought by parliament for the nation. It now contains specimens illustrating every branch of anatomy and pathology. In conjunction with the Royal College of Physicians, the college forms a conjoint board for the examination of students and the granting of licences to practise medicine, surgery, and midwifery. The college is very active in the field of postgraduate



teaching and also maintains laboratories for surgical research. It includes Faculties of Anaesthetists and of Dental Surgery. There are also royal colleges of surgeons in Edinburgh and Dublin. The charter of the former dates from 1505, and the latter was incorporated in 1786. Both conduct examinations and grant degrees in surgery. In 1920 a new body, known as the Association of Surgeons of Great Britain and Ireland, was formed, and there are societies representative of the various surgical specialties. Consult Plarr's *Lives of the Fellows of the Royal College of Surgeons of England*, rev. ed., Sir D.A. Power, 2 vols., 1930.

Surgeon's Daughter, THE. One of the Waverley novels by Scott, published in 1827. The heroine is Menie Gray, motherless daughter of a Scottish village surgeon, whose two pupils, Richard Middlemas and Adam Hartley, are her suitors.

SURGERY AND ITS PRACTICE

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This article surveys the various fields of contemporary surgery and deals with diagnosis and equipment. See the article Medicine; also Anaesthesia; Artificial Limbs, etc.; and biographies of Horsley; Hunter; Lister, and other surgeons

The word surgery, or chirurgery, is derived from the Greek *cheir*, hand, and *ergein*, to work. It is the science and art of treating diseased or accidental conditions by manipulation and by the use of the knife. Surgery was practised by the ancient Egyptians, and many examples of their instruments have been preserved. The two great schools of surgery in antiquity were, however, the Indian and the Greek, both of which attained a degree of excellence unequalled until modern times. In Greece the Hippocratic collection of the 5th century B.C. sums up the results of experience hampered by the absence of dissection which, introduced in the Alexandrian age, led to advances in many directions, as shown by the compendium of Celsus.

Ancient surgery culminated in the work of the Byzantine Paul of Aegina (c. A.D. 650) after whom the art fell into a state of increasing decay for nearly 900 years, as the Arabs, who kept alive a knowledge of medicine, were forbidden by their religion to practise anatomy. Paracelsus combining originality with fantastic theories, began to free surgery from the mass of tradition and superstition that encumbered it, but much greater service was rendered by the great

French military surgeon Ambroise Paré. His contemporaries, the Paduan professors, A. Vesalius and G. Fallopius, founded modern anatomy; and with the scientific movement in the 17th century, progress became continuous. The pioneer in England was Richard Wiseman (c. 1622-76). A century later a great advance is marked by the work of John Hunter.

TRAINING. Today there are experienced surgeons in all the great cities of the British Isles. For a surgeon to be able to put the letters F.R.C.S. after his name is a guarantee to the public that he or she has undergone an intensive course of special training and has passed the examination which has enabled him (or her) to be called a fellow of the Royal College of Surgeons (of England, Edinburgh, or Ireland). A wise man, if he has to undergo an operation, will do well to find out first whether the surgeon of his choice holds this qualification.

SPECIALISATION. Plastic surgery, in which the British were pioneers, was developed during the First Great War. During the Second, great strides were made in the various plastic centres formed to restore the disabled. Many thousands of servicemen and civilians owe their useful citizen-

ship to the skill and care they have received from the surgeons and nurses in these hospitals. This trend towards specialisation is not confined to plastic surgery; since 1900 surgeons have increasingly tended to confine their activities to limited areas of the body. The neuro-surgeon confines his operating to the brain and spinal cord, while a urologist deals with the kidneys and bladder, an orthopaedic surgeon with the bones and joints, a thoracic surgeon with the heart and lungs. Great changes have taken place since the days of the barber-surgeons.

DIAGNOSIS. It is important that diagnosis should be accurate. This has been aided enormously by the almost daily improvement in the technique of radiology. X-ray photographs enable the surgeon to discover stones in the kidney and to test the functions of organs such as the gall bladder, by means of swallowed or injected dyes which are opaque to the X-rays; to know with certainty the relative position of fragments of bone in cases of fracture; and to follow by a series of photographs the actual course taken by the passage of food through the alimentary tract after the swallowing by the patient of a barium meal, thus revealing the presence—or absence—of kinks or abnormalities and indicating exactly the site for any necessary surgical interference. Chemical and microscopical tests on the blood, the urine, and the cerebro-spinal fluid have also greatly advanced diagnosis.

PREPARATION FOR OPERATION. Instead of purging the bowel from above and emptying it from below by an enema, efforts are now concentrated rather on attempts to improve the patient's general health by measures designed to fit him better for the anaesthetic. The patient is taught breathing exercises to increase the vital capacity of the lungs, required to limit his smoking and to go to bed early in the period immediately preceding the operation. In other words, he is encouraged to go into training.

EQUIPMENT. The marvellous successes of modern surgery depend upon many things. Most important is knowledge of anatomy, whereby almost every organ in the body can be laid bare, examined, and in many cases remedied where diseased conditions exist, without serious injury to surrounding structures and with little or no loss of blood. There must be safety of anaesthesia, which under skilled

administration allows the surgeon to perform prolonged operations without pain or movement and with a minimum of shock on the part of the patient. Aseptic and antiseptic precautions must be taken. Meticulous attention to detail ensures that the most delicate operations can be undertaken with the almost certain hope that healing will take place by first intention, i.e. without the appearance of pus, or matter, which would indicate the invasion of tissues by deleterious germs. The operating theatre has been so well publicised during the last few years, in books and films, that there can be few people unable to picture it in their mind's eye. It is not universally appreciated, however, how much physical fitness and endurance is needed by surgeons and sisters to stand up to this highly specialised and highly demanding work.

Sterilised Equipment and Clothing

All instruments and appliances are sterilised before use in an adjacent sterilising room furnished with apparatus for boiling with superheated steam. Dressings, towels, rubber gloves, are also included. After a preliminary thorough washing of the hands, sterilised gowns are put on by the surgeons and nurses, sterilised masks are adjusted, covering the whole of the head, face, and neck (except for an aperture for the eyes), sterilised leggings are pulled on over boots and fastened well above the knee; so that apart from eyes and hands, no part of the person or ordinary clothing is left uncovered by surgically clean material. After a further scrubbing of the hands, surgical india-rubber gloves are pulled on and made to overlap the wristbands of the operating gown. The patient is given an injection of morphia or its equivalent a little time before the administration of the anaesthetic. This dulls the senses and promotes a feeling of warmth and comfort and peace of mind. The actual process of going to sleep is often induced by an injection into one of the veins of the elbow, and continued by a mask over the face only after the patient is unconscious, so that there is no longer any need to anticipate the horrors of suffocation.

EARLY DIAGNOSIS. However skilfully a surgical operation may be performed, the permanence of the result obtained is related to one single fact above all others—early diagnosis. Too much emphasis cannot be placed on the vital importance of patients re-

porting to their doctor immediately they notice a lump anywhere or the sudden onset of a discharge or loss of blood from any of the body orifices. If early cancer of the breast is treated by successful operation, 90 p.c. of the patients are alive 10 years later. A wider knowledge of the excellent results of treatment of early cancer would help to remove much fear of the knife, and so result in earlier surgery and longer life.

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Surinam. River of Surinam or Dutch Guiana. It flows in general N. to reach the Atlantic Ocean near Paramaribo after a course of about 400 m. It is navigable by large vessels for 40 m. and by smaller craft for 100 m.

Surinam OR DUTCH GUIANA. Country of S. America, under the constitution of 1922 forming one part of the kingdom of the Netherlands. It lies between British Guiana on the W. and French

descendants of slaves who escaped into the jungle, live a life almost identical with that of their ancestors in 17th cent. Africa.

Surinam is administered by a governor and a council of four nominated by the ruler of the Netherlands. The state has 15 members, 10 elected, five appointed by the governor. Language, laws, and coinage are Dutch. Exports include rice, maize, rum, sugar, molasses, bananas, coffee, and cacao. Much bauxite and some balata go to the U.S.A., but gold production, once large, is declining. Members of Columbus's third expedition landed in Surinam in 1500. The colony was founded in 1650 by Lord Willoughby, then governor of Barbados, and by the peace of Breda, 1667, was exchanged with the Dutch for New Amsterdam (now New York). Great Britain held it again, 1799–1802, and from 1804 until it was finally returned in 1815.

Surinam Toad (*Pipa americana*). A large species of toad indigenous to Guiana and Brazil. It is of distinct form, owing to the triangular shape of the head and the small eyes; the upper side is blackish brown studded with spine-bearing pimples, and the smoother underside whitish. The mouth is deficient in both tongue and teeth. The tips of the fingers of the forelimbs have star-like expansions, whilst the three inner toes of the webbed hind feet are provided with claws—the only toad known to be so furnished. Its entire life is spent in the water.

At the breeding season the skin of the female's back becomes thickened and softened. The eggs first extruded cling to the back and are pushed forward by those following, until the upper side is covered by about 100 (70–120) eggs. The soft skin rises between and around them so that they become entirely embedded in it. Development continues until the tadpole stage has been completed, when the perfectly formed toads emerge from their capsules, the process taking about 12 weeks. The pitted skin of the mother is then shed. During the dry season the Surinam toad aestivates by burying itself in mud.

Surname (Fr. *surnom*, from *sur*, in addition; *nom*, name). Name borne in common by the members of a family and their descendants in the male line. The totem names of primitive races, the Roman *cognomina*, the old Teutonic patronymics in *-ing*, and the clan names of



Surinam Toad. Female of the South American toad, showing young issuing from cavities in her back

Guiana on the E. and is bounded N. by the Atlantic and S. by Parastate, Brazil. The Corentyn flows along the W. and the Maroni along the E. frontier; other rivers are the Coppenam and the Surinam, and communications are mainly by river boat. In the S. are impenetrable forests and savannas, culminating in the Acaray range. Topography, climate, and products resemble those of British Guiana (q.v.). Only a tenth of this area of 55,143 sq. m. is settled, most plantations lying along the banks of the river Surinam. Near its mouth stands the capital, Paramaribo (pop. 73,067), which has a fair harbour and an airport. Seven-eighths of the pop. of 203,580 live along the coastal belt. Five tribes of Bush Negroes,

the Celts closely resemble surnames, but many nations, *e.g.* the ancient Greeks and Jews, and Mahomedans, have had none, and some peoples, like the Welsh and Jews, have adopted them within the last two or three centuries. Noble and landed families began in the 12th century to use surnames, generally (a) territorial, with a prefix (*de, von, etc.*) which does not always denote nobility, or (b) patronymic, *e.g.* Fitz—(son).

English surnames belong mostly to four classes: (1) patronymics, *viz.* Anglo-Saxon tribal names—Harding, Manning; Anglo-Saxon, Norse, French, or common personal names—Godwin, Kenrick, Osborn, Gilbert, Philip; with the suffix *-s* (for son), as in Richards; with *-son*, especially in districts settled by Scandinavians or Flemings, as in Wilson, Dixon; with a diminutive, *e.g.* Hancock, Watkins, Willett, Collins; (2) names indicating the place of residence or origin; general, Dale, Church, Attwood; particular, Walton, Harcourt, Darbshire, French; (3) occupational—Baxter (baker), Webb (weaver), Walker (fuller), Spencer (steward), Knight, Monk; (4) personal descriptions and nicknames, such as Long, Black, Armstrong, Toogood. Many names are fanciful designations of foundlings, or corruptions of foreign names. Cornish names in Tre-, Pol-, and Pen- are place names. Most Welsh surnames are patronymics, often preceded by Ap (*i.e.* map, son) shortened in Prichard, Bevan, etc. The Highland and Irish Mao is cognate. Irish O' represents *Ua*, grandson.

In Scotland a landowner is often known by the name of his estate instead of his surname, or adds it to his surname, *e.g.* Weir of Hermiston. A wife in Scotland retains her maiden name in legal parlance, generally adding her husband's name as an alias. By English law any person is at liberty to change his surname, and in wills the adoption of the testator's surname is often made a condition of a bequest. See Name; Place Names; consult Dictionary of English and Welsh Surnames, C. W. Bardsley, 1901; British Family Names, H. Barber, 2nd ed. 1903; Surnames, E. Weekley, 1916.

Surplice (late Lat. *superpellicem*, over the fur). Vestment of the Anglican and R.C. Churches. The Anglican surplice is a white linen garment reaching at least to the knees, gathered at the yoke and made with ample sleeves. Its

use is not restricted to priests, but the surplices worn by choristers and readers are usually less full



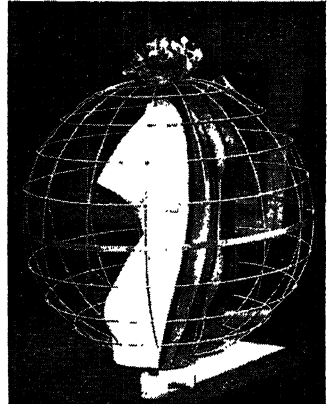
Surplice as worn in the Anglican Church

than those worn by the clergy. In the R.C. Church the surplice is ornamented with lace and reaches only to the hips. As the word implies, the garment was originally placed over the furs worn by priests when conducting the long services in cold churches. Its recorded use as a vestment dates from the 12th cent.

Surrealism. Art movement. The name was chosen to suggest a quality above and beyond the reality of everyday life. Surrealism may be described as the expression of dreams, both waking and sleeping, their symbols, and deep fantasies of the subconscious. There was nothing essentially new in this form of art; indeed the surrealists claimed for their own such figures as the 16th century Flemish artists Bosch and Breughel, together with Lewis Carroll and Edward Lear. But whereas the older artists linked the subconscious life with the conscious, surrealists chose their subject matter from symbolism provided by the subconscious. As a movement, a "deliberate association"

may be said to have arisen out of Dadaism (*q.v.*) and the researches of Freud, together with the dream paintings of the Italian Giorgio de Chirico (b. 1888) and the Russian Marc Chagall (b. 1887). The most famous exponent of this essentially romantic movement was Salvador Dali (b. 1904). Most of the significant surrealist painters were not French, for the German Max Ernst (b. 1891), the Swiss Paul Klee (1879–1940), and one aspect of the work of Pablo Picasso (b. 1881), a Spaniard, should be noted.

Surrey. County of England. Its area is 722 sq. m., and it is bounded on the N. by the Thames. The N. Downs stretch across the co., their highest point being Leith Hill (965 ft.). The chief rivers are the Wey and Mole, flowing to the Thames, and the Eden to the Medway. Kingston-upon-Thames is the

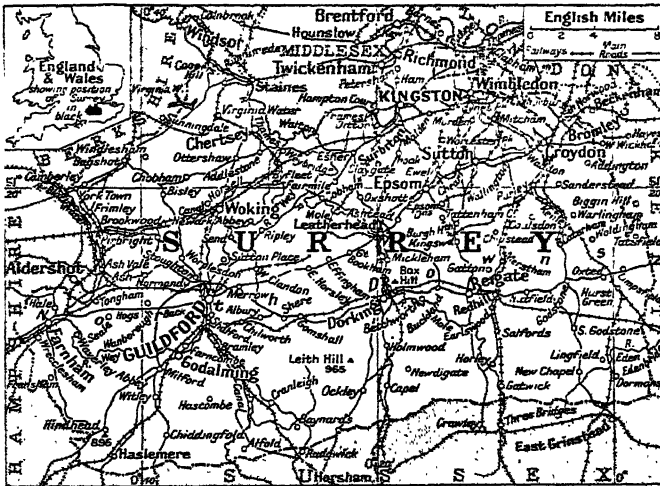


co. town; other towns are Guildford, Reigate, and Godalming. Croydon, Richmond, and Wimbledon are boroughs on the outskirts of London.

The county is noted for its many heaths and commons. The soil is not very fertile, but cereals and, around Farnham, hops are grown. Sheep are reared on the Downs. There are many market gardens on the suburban fringe, and paper is made on the banks of the Wandle. This is one of the chief cricketing counties, and has famous racecourses. Places of interest or beauty are Epsom, Woking, Farnham, Dorking, Waverley Abbey, Gatton



Surrealism. Two examples of the influence of this art movement. Ornament of *Insomnia*, oil painting by Tanguy Ives; and, upper picture, *The Last Journey of Captain Cook*, a construction by Roland Penrose, 1936



Surrey, England. Map of the home county south of the Thames

House, Newark Priory, Sutton Place, Hindhead, Box Hill, Runnymede, Virginia Water, Friday Street; Kew Gardens, Richmond Park; pretty villages such as Shere, Betchworth, and Chiddingfold. The Pilgrims' Way and Stane Street may be picked up at various points. Ten co. and nine borough M.P.s are elected. The co. is mainly in the dioceses of Guildford and Southwark. There are rly., bus, and Green Line services to London.

The Surrey Iron rly., completed in 1805 for the carriage of goods from Wandsworth to Croydon, had wagons drawn by horses, one horse drawing a load of 55 tons 6 m. in 1½ hrs. The rly. was closed in 1830, but a section with its stone sleepers is preserved in Purley recreation ground.

In early days Surrey was in the kingdom of Mercia, and then in Wessex. Ockley is regarded as the scene of a great Danish defeat by Ethelwulf in 851. After the Norman Conquest glass and iron were made in Surrey. In 1888 Southwark and other districts were taken away to form part of the co. of London. Pop. (1931) 1,180,878.

LITERARY ASSOCIATIONS. Denham's poem, Cooper's Hill, describes the Thames-side hill of that name. Many of Cobbett's Rural Rides were taken near his native Farnham. Jane Austen's Highbury is variously identified as Leatherhead, Dorking, and Esher. Richmond Hill is described in Scott's *Heart of Midlothian*. Meredith wrote much of this county, and in several poems described the country about Box Hill; he is

buried at Dorking. Near here Disraeli wrote *Coningsby*. Sir G. Chesney wrote an account of an imaginary battle of Dorking which had some popularity in 1871. Edna Lyall in her stories presented Farnham as Firdale, while Conan Doyle told of the old-time Waverley Abbey in Sir Nigel. Baring-Gould set the scenes of *The Broom Squire* about Hindhead. Woking and its immediate neighbourhood are utilised in almost photographic detail as the scene of the first landing of the Martians in H. G. Wells's *War of the Worlds*.

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Surrey, EARL OF. English title successively granted to several noble families, and since 1483 held by the dukes of Norfolk. William de Warenne, who appears as the first earl of Surrey, was a Norman follower of William I, and received the grant c. 1088. Although the direct line failed with the 3rd earl, 1148, the title passed to Hamelin Plantagenet, who had married the last earl's heiress. Their successors were earls of Surrey until the failure of the male line in 1347, when the title devolved on Richard Fitzalan, earl of Arundel, a nephew of the last earl. On the death of Richard's son, Thomas, 1415, the title reverted to the crown. In 1451 the earldom was granted to John Mowbray, 4th duke of Norfolk and last of the Mowbrays, and it was regranted in 1483 to Thomas Howard. Since then it has been a courtesy title of

the eldest sons of the dukes of Norfolk. See Howard; Mowbray.

Surrey, HENRY HOWARD, EARL OF (c. 1517-47). English courtier and poet. Son of the 3rd duke of Norfolk, his early years were spent at Kenninghall. He became a courtier and fought with distinction in France, being wounded severely at Montreuil. On being defeated by a superior force at St. Étienne while he was governor of Boulogne, he was recalled in 1546. Falsely accused of treason, before hostile judges and packed jury, he was beheaded on Tower Hill, Jan. 19, 1547. He was interred at All Hallows, Barking, and his remains were afterwards removed to Framlingham, Suffolk.

As a poet, following the Italian model of Petrarch, he was co-founder with Wyatt of the English sonnet-form and the first to use in English, in his translation of the *Aeneid* (i and iv), decasyllabic blank verse. His songs and sonnets were first printed in Tottel's *Miscellany* in 1557. His sonnets to the Fair Geraldine were written in accordance with the Petrarchan convention. "Geraldine,"



Henry Howard,
4th Earl of Surrey

Lady Elizabeth FitzGerald, was a child at court when the verses were composed, but Nashe, in his *Jacke Wilton*, built on them a romance which others have copied, and Scott wove into his *Lay of the Last Minstrel*. Surrey paraphrased in verse Psalms 8, 55, 73, and 88, and ch. 1-5 of *Ecclesiastes*. See *Sonnet*; consult also *Poems*, with Life, by A. Chalmers, 1810.

Surrey Commercial Docks. One of the dock systems of the Port of London. They lie between the pool of London and Limehouse Reach, cover 380 acres (160 acres of water), and are largely used for the landing and storage of timber. Incorporating the docks once used for the Greenland whalers, first opened in 1807 and since that date greatly enlarged, one of them is still named Greenland Dock, and from this issues the Surrey Canal, which extends to Camberwell and Peckham.

Surrey Theatre, ROYAL. Former London playhouse. It was in Blackfriars Road, S.E.1. The first theatre erected on the site, almost adjacent to St. George's Circus, was opened, Nov. 7, 1782, under the management of Hughes and Charles Dibdin. Known as the

Royal Circus and Equestrian Philharmonic Establishment, it was burnt down, Aug. 12, 1805. It was rebuilt and reopened, Easter Monday, 1806, under the management of R. W. Elliston, who changed its name to the Surrey. It later acquired some distinction as the home of melodrama and pantomime. This building also was burnt down, 1865. The third theatre, used as such until the late 1920s, continued for a while to function as a cinema. The building was demolished by German bombs during the Second Great War. Sir Arthur Sullivan's father was a violinist in the Surrey theatre, 1845, when the future composer was born in Bolwell Street. In Dickens's *Little Dorrit*, Fanny Dorrit was a dancer at the theatre, and her uncle Frederick played the clarinet in the orchestra.

Surrogate (from Lat. *surrogare*, to elect in place of another). Deputy, substitute, or delegate. In eccles. government a surrogate is the deputy of a bishop or a diocesan chancellor who grants marriage licences.

Surtax. A further income-tax. It is charged on incomes exceeding a figure fixed by the annual Finance Act, and is payable in addition to ordinary income tax. Surtax has taken the place of the former super-tax since 1928-29. Surtax is payable only by individuals and not generally by corporate bodies such as companies. The rate of surtax increases with the amount of income. During and after the Second Great War the combined effect of income tax and surtax was such that, with incomes exceeding £20,000, the amount of the excess bore tax at the rate of 19s. 6d. in the pound.

Surtees, ROBERT (1779-1834). British antiquary. Born at Durham, April 1, 1779, he was the only surviving child of Robert Surtees of Mainsforth. He was educated at Christ Church, Oxford, and in 1802 settled on his paternal estate at Mainsforth. Here he devoted himself



Robert Surtees,
British antiquary
From a silhouette

to compiling local material for his *History and Antiquities of the County Palatine of Durham*, 1816-23, completed by a 4th volume in 1840. Three ballads from his pen, *Barthram's Dirge*, *The Death of Featherstonehaugh*, and *Lord*

Eurie, were unwittingly included as ancient ballads in Scott's *Minstrelsy of the Scottish Border*. He died at Mainsforth, Feb. 11, 1834. The Surtees Society, founded after his death for the publication of historical MSS. concerning northern counties, has published some 150 volumes.

Surtees, ROBERT SMITH (1803-64). British novelist and writer on sport. Second son of Anthony Surtees, and educated at Durham grammar school, he began practice as a solicitor in London, but turned to journalism, writing for the *Sporting Magazine*. In 1831, with



Robert S. Surtees,
British novelist

Rudolph Ackermann, he founded *The New Sporting Magazine*, in which first appeared his celebrated character Mr. John Jorrocks. The Jorrocks episodes were collected together and published as *Jorrocks's Jaunts and Jollities*, in 1838. Jorrocks also figured as the principal character in *Handley Cross* (1843), and an enlarged edition, 1854. The most important of Surtees's other novels were *Mr. Sponge's Sporting Tour*, 1853; *Ask Mamma*, 1858; *Plain or Ringlets?*, 1860; and *Mr. Facey Romford's Hounds*, 1865. For these works Leech produced some of his best work. Surtees died at Brighton, March 10, 1864. A critical study by F. Watson was published in 1933.

Surtout. In heraldry, a small shield, emblazoned with a full coat of arms, and placed in the centre of the paternal coat. It is a method of indicating ownership. Arms of pretension are thus borne.

Suruga Wan. Inlet on the S. coast of Honshu, Japan. It is separated from Sagami Wan by a peninsula forming the prefecture of Izu. On its W. shore in Shizuoka.

Survey, COURT OF. British court of law dealing with appeals concerning unseaworthy ships. Composed of a judge and two nautical assessors, it was formed under the Merchant Shipping Act, 1876. Boards of Survey are bodies of medical officers who examine physically officers and men of the navy.

Surveying (Anglo-Fr. *surveier*, to overlook). Art of ascertaining by measurement the shape and size of any part of the surface of the earth for representation on a reduced scale. Such a survey is necessary in the preparation of maps, par-

ticularly those known as the ordnance survey maps, in many kinds of civil engineering works, as the construction of railways, canals, tunnels, roads, reservoirs, etc.

Broadly speaking, surveying can be said to be practical geometry and trigonometry, for it is concerned with the finding of the distances between objects and their angular relations to one another, from which other factors may be deduced.

The instruments used may be divided into two broad classes, those for measuring lengths, and those for measuring angles. The former include the Gunter's chain, a chain 66 ft. in length, divided into 100 links, nowadays chiefly used only where area or length alone is required. The more usual measuring instrument is the 100 ft. chain or tape, divided into a hundred links or divisions of one foot each. The tape is steel, or more usually the alloy "Invar" the latter having a small coefficient of expansion due to heat. Each foot on the tape is subdivided, and more accurate measurements can be made than with a chain. Smaller and larger tapes are also used according to the character of the work being undertaken. In geodetic surveying, where greater accuracy is required than in plane surveying, special metallic rods, called base bars, are often used in order to measure the necessary base lines.

Instruments for angle measuring include those for ascertaining direction, and also levelling instruments. Such instruments include the prismatic compass, theodolite, level, transit, box sextant, range-finders, etc., separately described. The plane table is an instrument enabling the work of survey to be plotted at the time. It consists of a drawing board mounted on a tripod, which has the necessary screws for levelling attached to it. It is used in conjunction with other surveying instruments recording distances and angles, and these are plotted immediately on the plane table. The plane table enables rapid surveys of a reasonable order of accuracy to be made, and has the advantage that the surveyor can employ less skilled assistants than those required to use and read many of the more complicated surveying instruments.

In plane surveying no account is taken of the curvature due to the shape of the earth, which introduces a fundamental inaccuracy. The inaccuracy increases with the area being surveyed at one time,

but it is small in a large part of the survey work required in engineering. Plane surveying has the advantage of comparative simplicity over the more accurate geodetic survey. In ordinary land surveying the area obtained is that between the vertical planes surrounding the boundary being measured, and is the horizontal projection of the real surface. The area is obtained by triangulation methods, *e.g.* a division of the irregular shape into triangles, or by the use of Cartesian coordinates by which the rectangular distances of points in the area from certain fixed lines are measured.

The points from which lines and angles are measured are called stations, and stations should be so placed with reference to one another that the triangles formed by them do not present any abnormally short or long side. Such uneven sided triangles always lead to difficulties in, if not inaccuracies of, measurement. Traverse is the name given to the survey of a number of stations, the position of each station being of course known with reference to the one previously measured. Figure 2 shows a closed traverse and the method of calculating its area.

ABCDFGH is the closed traverse, ABC, etc., being the stations. NS, EW are north and south and east and west directions through A, the station at which the surveyor begins his measurements. These measurements are the lengths of the lines AB, BC, CD . . . and their bearings. The latter may be measured from the fixed directions NS, EW, or may be a measure of the angle the line being measured makes with the last one measured. The coordinates of the stations, *e.g.* Bb, Dd, etc., are known as northings and southings, eastings and westings, or latitudes and departures, and can easily be calculated from the lengths and bearings. The coordinates of the stations being known, the area of the figure follows from the usual geometrical considerations. If any boundary of the area is too irregular to be considered a straight line between two stations, as in Axyz B in Fig. 1, a series of perpendiculars or offsets Xx, Yy, Zz, are drawn on the straight line AB and measured. These offsets divide the irregular portion of the area

into triangles and trapezoids whose individual areas can be closely approximated to.

In a topographic survey the same methods are observed, such a survey merely differing from an ordinary land survey in taking account of the physical features. The land survey is concerned with horizontal distances, and makes its own landmarks as it were. The topographical survey makes use of the actual landmarks and also the contour of the land. Such a survey usually follows more closely that of a geodetic survey.

A hydrographic survey is one concerned with charts of the sea-

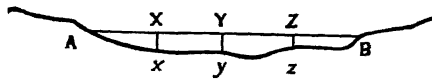


FIG. 1

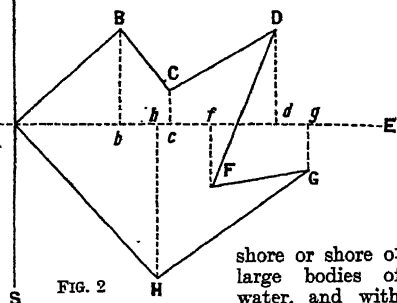


FIG. 2

Surveying. Diagrams showing stations and measurement lines of a closed traverse, and, above, those for an irregular boundary. See text

shore or shore of large bodies of water, and with measurement of the velocities of rivers, etc. It is for all practical purposes the preliminary for the preparation of navigation charts.

Mine surveying deals with both surface and underground surveys for mining purposes. The surface survey follows that of an ordinary land survey, and the underground surveys help to form a basis of calculation of the ore being taken from the mine or still in it, the locations of galleries, shafts, etc.

A geodetic survey takes account of the curvature of the earth, and is therefore more accurate than the plane survey. The ordnance surveys carried out by governments are geodetic surveys. Much of the work follows that of plane surveying, but angles are more used than lengths. The preliminary length measured is called the base line, and is obtained with as great accuracy as possible. From the ends of the base line angular measurements of various points are obtained and by triangulation other points and distances.

A type of survey of increasing importance is the aerial survey. A series of overlapping photographs

of the area to be surveyed are taken from the air. All objects within the area are immediately shown in their relative positions. In conjunction with other methods, this process supplies a quick method of obtaining maps of a district, and is invaluable in the charting of dense forest areas, *e.g.* in Central Africa. See Air Photography; Chart; Geodesy; Hydrography; Maps and Mapmaking; Mining; Ordnance Survey; Theodolite.

Surveyor (Anglo-Fr. *surveleur*, overseer). One who measures land or buildings, and may also supervise constructive work. Surveying of land and buildings may be combined with architectural practice, but the tendency is to separate the professions. The measurement of

quantities of materials in buildings is a separate profession (see Quantity Surveyor). The land surveyor's duties vary widely according to the range and purpose of his work. Geodetic surveying is concerned with the figure and area of the earth or large portions of it. In Great Britain this is entrusted to the staff of the ordnance survey office, Southampton. Ordnance survey maps are used by land surveyors and geologists as a basis for their work. Geodetic surveyors usually accompany important expeditions where the survey of large areas of country is a leading object.

Land surveyors in private practice are chiefly concerned with the administration of private property and estates, and the layout of roads and earthworks. Surveyors to local authorities combine land surveying with work on roads, sewerage, housing, and public buildings, and also the administration of building by-laws. The mine surveyor measures and plots underground shafts and workings.

The work of surveyors concerned with the extent and valuation of land, more especially for taxation purposes, is called cadastral surveying. In this work the large-scale ordnance survey maps are widely used.

The Chartered Surveyors' Institution, 12, Great George St., Westminster, London, S.W.1, holds examinations for membership, which is the recognized qualification in all branches of surveying. After a preliminary test in general knowledge, the candidate takes an intermediate examination which comprises surveying and levelling, book-keeping, central and local government, economics, draughts-

manship, mensuration, and trigonometry. In addition, specialist subjects must be taken by would-be land agents, valuers, and building and quantity surveyors. The final examination is concerned with all subjects relating to the selected branch, and a pass carries the designatory letters P.A.S.I. Surveyors over 30 years of age who have held a responsible post for at least five years may qualify for fellowship (F.S.I.) without taking the intermediate examination. The Royal Institute of British Architects holds examinations for the office of district surveyor in London and building surveyor under other local authorities.

Survival. Continued existence after death of the human spirit as an individual entity. Attempts to obtain scientific proof are attended by extreme difficulty. Negative results in no way affect religious belief, as the barrier between the two worlds may be absolute. Apparitions seen hours after death may be due to deferred telepathic impressions. In judging alleged messages conveyed by automatic writing or disinterested mediums, the possibility of telepathy from the living must be considered, although in certain complex cases it seems excluded. *See* Immortality; Psychical Research; Spiritualism.

Survival of the Fittest. Biological term for a process in evolution (*q.v.*) by which the struggle for existence eliminates the least adapted of a race, thus selecting those most fit to perpetuate their kind. *See* Natural Selection.

Surya. Hindu god representing the sun, and one of the gods still most generally honoured. He is described as riding in a chariot with his head surrounded by rays. *See* Hinduism.

Susa OR **SHUSHAN.** Ancient city of Persia. The capital of the old province of Susiana, it stood on the river Choaspes, the modern Kar Pheh, and was the winter residence of the Persian kings. The ruins include the pilgrim resort known as the tomb of Daniel, and the acropolis. Excavations by Williams, Dieulafoy, and others laid bare the citadel and the imposing remains of the colonnade of the palace built by Darius, and restored, after destruction by fire, by Artaxerxes Mnemon. *See* Shushan.

Susa. City of Piedmont, Italy, in the prov. of Turin. It stands on the Dora Riparia, 32½ m. by rly. W. of Turin city. It contains San Giusto cathedral, rebuilt in

the 13th century, the ruined castle of La Brunetta, and a triumphal arch dedicated in A.D. 8 to Augustus. Strategically situated in relation to the roads over the passes of Mont Cenis and Mont Genève, it was for some time the capital of Piedmont, burnt by Barbarossa in 1174, and dismantled by Napoleon in 1796.

Susa (Fr. Sousse). Seaport of Tunisia. It is situated on the Gulf of Hammamet, 75 m. S. by E. of Tunis by rly. Exports are barley, wheat, phosphates, esparto grass, and olive oil. The old harbour, built by the Romans, is silted up; a modern one has been developed since 1900. S.W. of the town are vast Christian catacombs. Susa is dominated by a citadel, and in the old town is a fortress with seven bastions, the Kasr-er-Ribat. During the Second Great War Susa was occupied by the British 8th army without opposition, April 12, 1943, after an 80 m. advance from Sfax, entered on the 10th. The mixed pop. of Europeans, Jews, and Arabs is 28,465.

Susanna, HISTORY OF. One of the O.T. Apocrypha, an addition to the Book of Daniel, written probably between 80 and 50 B.C. It is the story of a beautiful Jewish exile named Susanna. She was seen bathing and admired by two Jewish elders. When she rejected lustful proposals they charged her with adultery. She was condemned to death, but saved by the interposition of Daniel who was able to prove the falsity of the charge.

Susceptibility. Term referring to the characteristic of a magnetised body which is defined by the ratio of the intensity of magnetisation produced in a substance to the intensity of the magnetic field to which it is subjected. The susceptibility of paramagnetic sub-

stances, *e.g.* oxygen, air, aluminium, platinum, is positive, while that of diamagnetic substances, *e.g.* bismuth, sulphur, graphite, mercury, is negative.

Suslik OR **SOUSLIK** (*Spermophilus*). Genus of rodent mammals, about 40 species, natives of N. Europe, N. Asia, and N. America. They are much like the marmots (*q.v.*) in form and burrowing habits, but are provided with cheek-pouches in which they convey provisions to their stores; hence they are sometimes called pouched marmots. *See* Gopher.

Suspension Bridge. Type of bridge in which a tower is constructed on each bank or on piers, and chains or cables are passed over them and anchored back to provide the actual bridge supports. Suspension bridges provide a clearer waterway for ships generally than other classes of bridge. *See* Bridge illus. pp. 1422, 1424; Clifton.

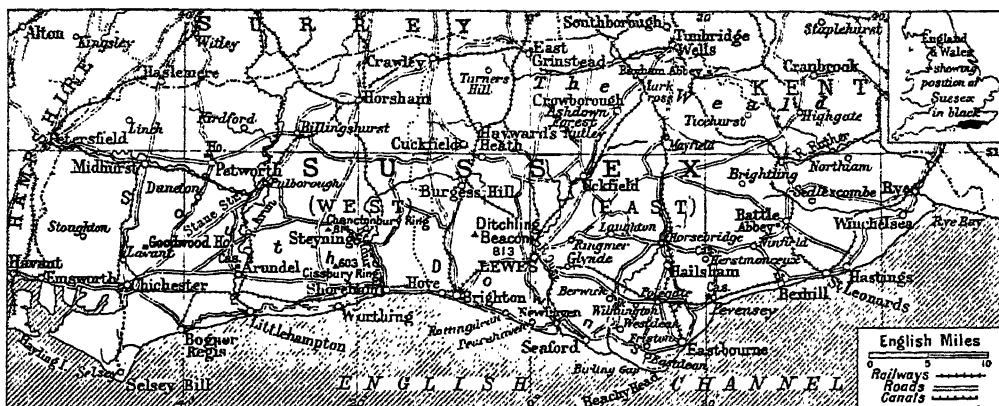
Suspension Current. Current which moves through a surrounding fluid because it is slightly heavier than the latter. The increase in weight is supplied by fine material being carried in suspension. Muddy river water pouring into a clear lake is heavier than the lake water; the velocity of the river water is checked and coarse material is deposited at the river mouth; but fine material in suspension often gives enough additional weight to the river water to cause it to move as a current on its own down the lake floor and through the clear water to the depths. These currents are taken into account in considering the silting up and discharge of reservoirs. They may have been responsible for the formation of submarine canyons.

Susquehanna. River of the U.S.A. Rising in two main branches, the N. branch in Otsego Lake, New York, and the W. branch in the Allegheny Mts., it unites at Sunbury, Pa., and follows a generally S. course to Chesapeake Bay, which it enters at Havre de Grace. It is shallow, swift-flowing, and generally unnavigable, and has a total length, including the N. branch, of nearly 500 m. The main tributaries are the Lackawanna, West Branch, and Juniata.

Sussex. Maritime county of England. Lying along the S. coast, it has a shore of 91 m. on the English Channel. Its area is 1,457 sq. m., and for administrative purposes it is divided into two counties, east and west, each with its council. It is the only county to preserve the



Susa, Italy. Campanile of the 13th century cathedral of S. Giusto



Sussex. Map of the southern maritime county of England, celebrated for its watering-places and beautiful pastoral scenery

Anglo-Saxon division into rapes, of which there are six. In the centre is the plain of the Weald, and crossing from Hampshire to Beachy Head is the range of hills known as the South Downs, rising to 813 ft. in Ditchling Beacon. The chief rivers are the Arun, Adur, Ouse, and Rother.

Sussex is celebrated for its breed of sheep, the Southdown, while horses and cattle are also reared. The soil along the coast produces wheat and there are many market gardens. Hops are grown in the E., and tomatoes near Worthing. The area under wood is considerable, and near Mayfield there was once a prosperous iron industry. Along the coast are large and popular watering-places, Brighton, Eastbourne, Hastings, and Worthing, as well as the smaller Rye, Winchelsea, Shoreham, Bexhill, Littlehampton, and Bognor. Newhaven is a port for France. Lewes is the co. town of E. Sussex, as Chichester is of W. Sussex. Chichester is also the seat of a bishop. Market towns include Horsham and Midhurst.

The county contains the ruins of Pevensey, Bodiam, and Hurstmonceux castles, and of Bayham and Battle abbeys; great houses such as Arundel and Petworth; and Goodwood, famous for races. It has earthworks at Cissbury and Chanetonbury. There are excellent communications with London by road and rly. Six co. and five bor M.P.s are elected. Pop. 769,859.

Sussex was originally the kingdom of the South Saxons, having been conquered by Ella about 477. Much of the county was then and later covered by the great forest of Andredsweald, of which there are remains in Ashdown Forest. In the 7th century the South Saxons were converted to Christianity and in 825 they submitted to Egbert.

Its importance during the Middle Ages was due to its position opposite France, and in it were several of the Cinque Ports.

LITERARY ASSOCIATIONS. Among poets, the earl of Dorset was born at Buckhurst, John Fletcher at Rye, Otway at Trotton, Collins at Chichester, Shelley at Field Place, Horsham. Selden, the antiquary, was a native of Salvington. The Downs and the coast inspired Swinburne, in his lines *To a Seamew*; Kipling, who lived at Rottingdean and Burwash, in his poem *Sussex*, and the tales in *Puck of Pook's Hill*; and Hilaire Belloc, resident at Shipley, in *The Four Men* and several poems. Storrington is associated with some beautiful poems of Francis Thompson. At Felpham Blake had his vision of faeries. Hastings and Hollington have memories of Lamb, and Rye of Henry James. Cobbett and Jeffries wrote much about Sussex. The neighbourhood of East Grinstead is described by Horace Smith in *Brambletye House*; the Brighton district by Ainsworth in *Ovingdean Grange*, Dickens in *Dombey and Son*, Thackeray in *Vanity Fair*, and in the novels of D. L. Murray. Sheila Kaye-Smith specialised in Sussex stories, especially of the Kent-Sussex border.

Bibliography. History of Sussex, 2 vols., M. A. Lower, 1870; *Highways and Byways in Sussex*, E. V. Lucas, 1904; *Victoria History of Sussex*, 2 vols., ed. W. Page, 1905-07; *The Sussex Coast*, I. C. Hannah, 1912; *Sussex*, H. Belloc, 1936.

Sussex, EARL OF. English title borne by the Radclyffe, Savile, and other families. The earls of Arundel were probably the first earls of Sussex, and after the earldoms of Surrey and Sussex were probably held unitedly by the Warenne family. In 1529 Robert Radclyffe was made earl of Sussex. He and his

successors were men of note until the death of the 6th and last earl in 1641. The greatest of them was Thomas, 3rd earl (d. 1583), lord-lieutenant of Ireland under Elizabeth, and a typical nobleman, courtier, scholar, and soldier of that period.

In 1644 a Yorkshireman, Thomas Savile, was made earl of Sussex. The title became extinct in 1671, but was revived for Thomas Lennox, Baron Dacre, in 1684. Again extinct in 1715, it was held by the Yelverton family from 1717 to 1799. In 1801 George III made his sixth son, Augustus Frederick (1773-1843), duke of Sussex. He contracted a morganatic marriage with Lady Augusta Murray, and their children took the name of d'Este.

Sussex Regiment, ROYAL. Regiment of the British army formed in 1881 by an amalgamation of the 35th and 107th Foot. The 35th was raised in 1701 at Belfast by the earl of Donegal, a strong supporter of the house of Orange. He adopted the orange facings for the regiment which gave it the nickname of Orange Lilies. Embodied as marines,

it served in the Cadiz expedition in 1702; won its first battle honour at the siege of Gibraltar, and was at the capture of Barcelona, and the disaster at Almansa. It



Thomas Radclyffe, 3rd Earl of Sussex
After Sir A. More



Sussex Regiment badge

was with Wolfe at Quebec, where its action against the French regiment of Royal Roussillon is commemorated by the Roussillon plume on its badge. It later fought at Martinique, Havana, and St. Lucia. In 1804 the 35th Foot was affiliated to the county of Sussex. It fought against the French in Italy and Egypt, and in 1809 was part of the force that captured the Ionian islands. The regiment was in India during the Mutiny.

Raised in India in 1854, the 107th Foot was originally the 3rd Bengal European Light Infantry, and was employed in Bengal until after the Mutiny, when it was transferred to British establishment. The 35th and 107th were amalgamated in 1881 as the 1st and 2nd battalions Royal Sussex, which fought in Egypt (1882-85) and in the S. African War.

Twenty-three battalions were raised for service in the First Great War and earned the battle honours: Retreat from Mons; Marne, 1914, '18; Ypres, 1914, '17, '18; Somme, 1916-18; Pilckem; Hindenburg Line; Italy, 1917-18; Gallipoli, 1915; Palestine, 1917-18; N.W. Frontier India, 1915, 1916-17. In the Second Great War, the regiment served in France (1940), E. Africa, and Burma. The depot is at Chichester. A Territorial battalion, the 5th Royal Sussex, is known as the Cinque Ports battalion, and wears as badge the arms of the Cinque Ports.

Sutcliffe, HALLIWELL (1870-1932). British novelist. Coming from Bingley, Yorks, he was a regular contributor to magazines, and wrote novels dealing with the life of the Yorkshire fells. Among these are *A Man of the Moors*, 1897; *By Moor and Fell*, 1900; *Windover Tales*, 1907; *Wilder-some*, 1919; *The Winds of March*, 1927. He died Jan. 14, 1932.

Sutcliffe, HERBERT WILLIAM (b. 1894). English professional cricketer. Born at Summerbridge, near Harrogate, Nov. 25, 1894, he served with the Sherwood Foresters in the First Great War, and first played for Yorkshire in 1919.

Herbert Sutcliffe,
English cricketer

He made more than 50,000 runs, more for Yorkshire than any other player. Opening batsman for England, he played in 27 Test matches against Australia between 1924 and 1934, and in his first

two scored 59 and 115, 176 and 127; the century in each innings equalling a record. With J. B. Hobbs (*q.v.*) he shared in 15 three-figure partnerships in all tests. In the rainy season of 1931 he had an average of 96.96, the highest ever by an Englishman; next year brought a total of 3,336, including 14 centuries, his biggest innings of 313, and a world record partnership of 555 with P. Holmes. A master of on-side play and possessed of wonderful patience, Sutcliffe ended his playing career in 1939. He published *For England and Yorkshire*, 1935.

Sutherland, DUKE OF. Scottish title borne by the family of Leveson-Gower since 1833. There appears to have been an earl of Sutherland as far back as the 13th century. This title came to the Gordons by marriage soon after 1500, and John Gordon, 7th earl (d. 1733), was a leading man in Scottish politics at the time of the union and of the rising of 1715. In 1771 the house of lords said the earldom belonged to Elizabeth Gordon, daughter of the earl who died in 1766. In 1785 she married George Granville Leveson-Gower (1758-1833), who became in 1803 marquess of Stafford. Thus the two titles were united, and so were the vast estates of the Scottish countess with the wealth of the English marquess. He was British ambassador in Paris, and was made duke of Sutherland in 1833. An eldest son of a duke of Sutherland is still known by this title.

His descendant is George Granville Sutherland-Leveson-Gower, 5th duke (b. Aug. 29, 1888), who succeeded to the title in 1913, and actively entered politics, being under-secretary for the colonies 1921-22, for air 1922-23, paymaster-general 1925-28, then under-secretary for war for a few months. He was grand prior of the Primrose League from 1922 and president of the Air League of the British Empire 1922-24. The duke owns much of Sutherlandshire, in which is his chief residence, Dunrobin Castle.

Sutherland Falls. Highest waterfalls in the world (1,904 ft.). They are in South Island, N.Z., on the W. coast of Otago, 14 m. S. of Milford Sound, amid some of the most magnificent scenery in the dominion. The water drops down a densely wooded mountain side in two great falls. In Lake Ada, into which the Sutherland Falls empty, there is excellent fishing; the whole district is popular with holidaymakers.

Sutherlandshire. County of Scotland. It is situated in the extreme N.W., and its area is 2,028 sq. m. It has a bold and precipitous coast on the N. and N.W., where is Cape Wrath (523 ft.), and is deeply penetrated by sea lochs, the Kyle of Tongue and Loch Eriboll among them. The surface varies between mountainous moorland and narrow valleys. There are several summits over 3,000 ft. high, Ben More Assynt being the highest. Loch Shin is the largest of



Sutherlandshire. Map of the extreme north-western county of Scotland, famous for its grouse moors and deer forests

many lakes; others include Assynt, Naver, and More. The chief rivers are the Oyckell, Helmsdale, Brora, Shin, and Fleet. Handa, Roan, and other islands belong to the county.

Sutherlandshire is known for its grouse moors and deer forests. The chief industries are the rearing of sheep, and fishing. Much of the land is cultivated by crofters. The soil is poor, although there are one or two fertile spots. Many acres were reclaimed from the sea by the dukes of Sutherland. Dornoch is the county town. Others are Golspie, Tongue, Scourie, and Lochinver. The county has remains showing traces of the Picts, and also of the Scandinavians. Its name, meaning south land, was given by the Norsemen of Caithness, who overran it in the 11th century. It was the home of the Mackays, Macleods, and other clans. With Caithness, it sends one member to parliament. Population 14,400.

Sutlej. River of the Punjab, the largest and most easterly of the five rivers. It rises near the sources of the Indus, Ganges, Gogra, and Brahmaputra, in the sacred Rakas Tal Lake, at the S. foot of Mt. Kailas, in Tibet, at about 15,000 ft. above sea level. At first a raging torrent, it crosses the Himalayas, skirts the Siwalik hills, enters the great alluvial plain at Rupar, and flows in general S.W. to join the Indus after a course of 900 m. Its waters are the source of a considerable irrigation scheme.

Sutras (Skt. *sūtra*, string). In Sanskrit literature, a class of commentaries on the Vedas, composed between the Vedic and classical periods. Consisting usually of strings of brief aphorisms in highly condensed language, they were learnt by heart as aids to memory in matters of ritual, law, philosophy, grammar, prosody, etc. See Sanskrit; Vedas.

Sutri (anc. Sutrium). City of Italy, in the prov. of Rome. It crowns an isolated hill, 950 ft., 29 m. N.W. of Rome, and has a modern cathedral damaged during the Second Great War, when it was captured by the Allied 5th army, June 8, 1944. Its chief interest is in the ancient walls and gates, Etruscan rock tombs, a rock church, and the rock-hewn amphitheatre dating from the time of Augustus. Here in 1046 a synod deposed Popes Sylvester III and Gregory VI on a charge of simony. Pop. est. 3,000.

Sutro, ALFRED (1863-1933). British dramatist. Born in London

August 7, 1863, and educated at the City of London school and in Brussels, he achieved success in 1904 with *The Walls of Jericho*, a comedy dealing with modern society. Among his other plays are *John Gladye's Honour*, and *The Barrier*, 1907; *The Builder of Bridges*, 1908; *The Choice*, 1919; *Far Above Rubies*, 1924; and *The Desperate Lovers*, 1927; *Living Together*, 1929. His reminiscences, *Celebrities and Simple Souls*, appeared shortly before his death, which occurred Sept. 11, 1933.



Alfred Sutro,
British dramatist

Suttee. The 13th century spelling of the Hindu word *sati*, used for the custom of widow-burning. See *Sati*.

Suttner, BERTHA VON (1843-1914). Austrian novelist. Born at Prague, June 9, 1843, she married Baron Arthur G. von Suttner, a successful novelist, in 1876. After serving as secretary to Alfred Nobel (*q.v.*) and writing a series of light novels, she made a reputation as an ardent pacifist with *Die Waffen Nieder!* (*Down with Arms*), 1889. Translated into several languages, the book gave impetus to the pacifist movement throughout the world, and she became vice-president of the international peace office at Berne, as well as president of the Austrian pacifist society, and a prominent member of later peace conferences. Her other novels included *Trente-et-Quarante*, 1893; *Emperor of Europe*, 1898; and *Schach der Qual*, 1898. She was awarded the Nobel peace prize in 1905, and died at Vienna, June 21, 1914.

Sutton, SIR GEORGE AUGUSTUS (1869-1947). British newspaper director. He was born Sept. 21, 1869, and in 1889 joined the secretarial staff of Alfred Harmsworth, who had founded the weekly periodical *Answers* (*q.v.*). By 1902 he had become a director of the Amalgamated Press, becoming vice-chairman, 1913, and chairman in succession to Northcliffe, 1915. He ceased active association with that company in 1927. Managing director, Associated Newspapers Ltd., 1927, he was vice-chairman during 1934-37. For his services as hon. director of publicity to the National War Bond Campaign, 1917-19, he received a baronetcy, 1919. He died Nov. 7, 1947.

Sutton, MARTIN JOHN (1850-1913). British agriculturist. The eldest son of Martin Hope Sutton, who with his brother Alfred founded the firm of Sutton and Sons, at the age of 21 he became a partner, and in 1887 head of the firm. He was made a fellow of the Linnean Society, and was a member of the national agricultural examination board. He died Dec. 14, 1913. His book, *Permanent and Temporary Pastures*, 1886, was based on an essay by his father, and he wrote papers on agricultural subjects.

Sutton and Cheam. Borough of Surrey, England. It is 11 m. S.W. of London, on the Southern Region of British rlys. and, being near the North Downs, is a popular residential "dormitory" for Londoners. It is situated on one of the main London roads to Brighton. Sutton and Cheam were amalgamated as an urban district in 1928 and received a charter of incorporation in 1934. S. Nicholas church, rebuilt in the 19th century, contains some interesting memorials. Sutton was mentioned in *Domesday Book* as being a place of some importance, then possessing two churches. Cheam (then Cheyham) was in 1018 given to the monks of Christ Church, Canterbury. Population 83,000.

Sutton Bridge. Urban dist. and river port of the Holland div. of Lincs, England. It is situated on the Nene, 7 m. N. of Wisbech, and is served by rly. It is 3 m. from the Wash, and stands on land reclaimed from the sea in the 19th century. Docks once erected here collapsed on the entry of the first vessel. Over the disused basin a golf course has been laid out. Pop. 2,837. About 3 m. away is the village of Long Sutton, which possesses a fine church with a Norman nave.

Sutton Coldfield. Mun. bor. of Warwickshire, England. It is 8 m. by rly. N. by E. of Birmingham. The chief building is the church of Holy Trinity; almost entirely rebuilt in the 19th century, it has a Norman font. There is a 16th century grammar school and a modern town hall. Sutton Park is a recreation ground covering 2,400 acres. Near the town is New Hall, a 13th cent. moated residence. The first charter was granted in 1528 to Sutton, and Sutton Coldfield became a borough in 1886, when it was a market town. It gives its name to a co. constituency. A television transmitter here came into operation in 1949. Pop. est. 46,226

Sutton Courtenay. Village of Berkshire, England. It stands on a backwater of the Thames, 2 m. E. of Abingdon. All Saints is an old church, restored in the 19th century. The manor house dates from the time of Edward III. At Sutton Courtenay the 1st Lord Oxford and Asquith made his home. Across the river is Culham, a village with a rly. station.

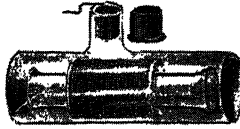
Sutton Hoo. Site of ship burials in Suffolk, England. It is 10 m. E.N.E. of Ipswich, and stands on the Deben estuary. In 1939 excavation of one of eleven burial mounds revealed the outlines of an Anglo-Saxon rowing boat in which was buried a pagan king of E. Anglia (possibly Raedwald in the 7th century). Many treasures in the grave made it one of the richest archaeological finds in W. Europe. The workmanship of jewelry and gold ornaments is finer than any other known to have been produced in Anglo-Saxon England; there are also silver dishes of Byzantine origin with Christian motifs, weapons, coins, and the remains of a harp. All are in the British Museum. *See* Anglo-Saxon Antiquities. *Consult* Anglo-Saxon England, F. M. Stenton, 1943; Sutton Hoo Ship Burial, British Museum, 1947.

Sutton-in-Ashfield. Largest urban dist. and a market town of Notts, England. It is 13 m. N. by W. of Nottingham, and has two rly. stations. The chief building is the church of S. Mary Magdalene, a 12th century edifice restored in the 19th. There are a town hall and three public libraries. Manufacture of hosiery is the staple industry, and around are coal mines, while light engineering and plastic industries are growing. Market days, Fri. and Sat. Pop. est. 39,880.

Sutton-on-Sea. A watering-place of the Lindsey div. of Lincs, England. It stands on the E. coast, 28 m. N.E. of Boston. Entirely modern, it has a rly. service and became popular towards the end of the 19th century. Pop. 1,000.

Suture (from Lat. *sueres*, to sew). In surgery, the closing of injuries of the tissues or of incisions; also the threads which are employed in the operation. The materials most frequently used are silk, nylon, horse-hair, catgut, and fine silver wire. Some sutures must be removed after the tissues have grown together; others are absorbed in the course of time.

Suva. Capital and seaport of Fiji. It occupies a beautiful and



Suture threads in a glass cylinder.

luxuriantly green site on the S. coast of Viti Levu. The rainfall is heavy—26½ ins. having been recorded in one day. The R.C. cathedral is the principal church, and there are missionary schools, grammar schools for Europeans (boys and girls), botanical gardens, and Albert Park. Government House discharges official business. There is a weekly air service to New Zealand. Pop. 11,398.

Suvarov, SUVOROV, OR SUWARROW, ALEXEI VASILIEVITCH (1729–1800). Russian soldier. Born at Moscow, Nov. 24, 1729, he entered the army, fighting against the Swedes and in the Seven Years' War. Against the Poles and later against the Turks, 1775–95, he made a reputation and as a general was constantly in the field and winning victories, securing the capitulation of Warsaw in 1794. In 1799 he came from an enforced retirement to lead an army to aid the Austrians in Italy. Having cleverly defeated the French in several engagements, he took his men across the Alps into Switzerland, but his plans failed and he fell back into Austria. After his death at St. Petersburg, May 18, 1800, he was regarded as the greatest military hero of Russia. *Consult* Life, K. Osipov, Eng. trans. 1944.

Suvla Bay. Bay of Gallipoli, Turkey. It is on the W. side of the Dardanelles between Suvla Burnu (Cape Suvla) and Nibrunesi points. It is also called Anafarta Bay.

Suvla Bay, LANDING AT. British operation in the First Great War, an episode of the Gallipoli campaign of 1915. The object was to gain control for the Allies of the central heights of the Gallipoli peninsula, following their failure to advance against the Turks from the S. in the earlier part of the summer. Reinforcements consisting of four divisions under Gen. Stopford were sent from Great Britain for the landing, which was planned to coincide with an Australian attack on Sari Bair and strong offensives at Krithia and near Bulair.

The Australian attack opened Aug. 6, and during the same evening the first of the new divisions, the 11th, landed at points N. and S.W. of Salt Lake, Suvla Bay,

about 4 m. N. of the Australian position. The 10th division landed early on Aug. 7, and the 53rd division on the night of Aug. 8–9. The initial landings took the Turks by surprise, but thereafter the operations miscarried at every point, even though the Turks were inferior in numbers and had withdrawn their artillery. A British front line was consolidated, and connexion was made with the Anzacs, but the Turks retained the advantage of high ground, overlooking the site of any possible advance, in spite of attacks on Aug. 10, and again on Aug. 21; and the position remained thus until the final evacuation of the Anzac and Suvla positions on Dec. 20. *See* Gallipoli Campaign; *consult* Gallipoli, J. Masefield, 1916; Gallipoli Diary, Sir I. Hamilton, 1920; Official History of the Great War—Military Ops.; Gallipoli, Brig.-Gen. C. F. Aspinall-Oglander, 2 vols., 1929–31.

Suwanee. River of the U.S.A. Rising in the S. of Georgia, it flows 240 m. S. through Florida to the Gulf of Mexico. It has become familiar as Swanee through the song, The Old Folks at Home.

Suzerain (Fr., from Lat. *sursum*, above). In feudalism, a lord paramount or overlord. The king, as ultimate owner of the soil, was suzerain-in-chief, his immediate vassals being the great barons who held their land on condition of rendering military service personally, and also through their own vassals, who in return for protection by their own suzerains were pledged to serve at their call. This system prevailed through all the grades of society, and formed the basis upon which the whole fabric of feudalism was built up. *See* Feudalism.

Sveaborg. Fortress in Finland. Called the Gibraltar of the North, it is situated on the Gulf of Finland, 3 m. S. of Helsinki, of whose harbour it forms the defence. The chief works of the fortress system occupy several islands. Sveaborg was fortified by the Swedes in 1749, and treacherously capitulated to Russia in 1808. During the Crimean War the Anglo-French fleet bombarded it, 1855.

Svealand. Central section of Sweden. With Götaland to the S., and Norrland to the N., it comprises the E. section of the Scandinavian peninsula. The name has become obsolete administratively since the division into läns or counties. Svealand contained the dist. of the central lakes Wener, Wetter, Mälär, and included many of the chief towns in addition to

Stockholm, the capital, as well as the most thickly populated part of the country.

Svedberg, JESPER (1653-1735). Swedish scholar. The father of Emanuel Swedenborg (*q.v.*) he was appointed professor of theology at Uppsala, and was bishop of Skara. His greatest works were a dictionary, 1716, and a grammar, 1722, which established the current Swedish orthography. He also wrote sacred verse. *Consult* Life, J. J. G. Wilkinson, 1889.

Svedberg, THEODOR (b. 1884). Swedish scientist. He was born Aug. 30, 1884, at Valbo, studied at Uppsala, and there was appointed lecturer in physical chemistry in 1907 and professor in 1912. Later he also directed the institute of physical chemistry at Uppsala. For research work and discoveries in the field of colloidal chemistry he received the Nobel prize for chemistry in 1926, and was made a member of the Royal Society and many foreign academies of science. His book on Colloidal Chemistry, 1924, was translated into several languages.

Svendborg. Seaport of Denmark. It is a picturesque old town on Svendborg Sound, on the S.E. coast of the island of Fünen. Some 27 m. by rly. S. of Odense, it occupies a hill-girt valley. There are iron foundries, tanneries, and ship-building yards. Two churches date from the 13th century. Pop. 21,346.

Svensden, JOHANN SEVERIN (1840-1911). Norwegian composer. Born at Christiania (Oslo), Sept. 30, 1840, he studied music with his father, a bandmaster. As a violinist he joined the orchestra at the Christiania theatre, and was teaching during 1872-77. After visiting London, Paris, and Rome, he became court conductor at Copenhagen, where he died June 14, 1911. A prolific composer of orchestral music, he is best known by four Norwegian rhapsodies, a romance for violin and orchestra, overtures to Romeo and Juliet and Björnson's Sigurd Slembe, a string quartet, and an octet.

Svengali. Character in George Du Maurier's novel, Trilby. A German-Jew, whose real name is Adler, he is a gifted musician, but a sinister and repulsive personality. Possessing hypnotic powers, he uses them ruthlessly upon Trilby O'Farrell to make her a great singer, despite her tone-deafness, exploiting her success as such for his own avaricious ends. When he dies of a heart attack as she is about to sing at a concert, the

spell breaks, and she can no longer sing in tune.

Sverdlovsk. City of the R.S.F.S.R. Formerly Ekaterinburg, it lies on the Asiatic side of the E. Urals, on the Isset, 175 m. E.S.E. of Perm. It is the centre of an area extremely rich in minerals, and is noted for many industries, especially the manufacture of armaments, machine tools, and soap. The Sverdlovsk factories for machine construction are among the most extensive in the world. A junction on the Trans-Siberian Rly., it is the chief city of the Ural industrial area; as such it was greatly developed after the Revolution, and gives its name to a region of the republic. It contains a university, other educational and scientific establishments, and is the headquarters of the Ural geological society. Two cathedrals were built in the 18th century. Founded by Peter the Great, it was named Ekaterinburg after his wife Catherine. The last tsar, Nicholas II, and his family were murdered here by Bolsheviks, July 16, 1918. Pop. 425,544.

Sverdrup, JOHANN (1816-92). Norwegian statesman. He was born at Jarlsberg, July 30, 1816. In youth he studied law, and in 1850 was elected a member of the Storting. He became leader of the Left or Radical party, and fought strenuously against the royal prerogative and for the dissolution of the union with Sweden. In 1883, after long struggles, his party came to power, but four years later the more advanced section of it broke away, and in 1889 he resigned. He died at Christiania (Oslo), Feb. 17, 1892.

Sverdrup, OTTO (1854-1930). Norwegian explorer. Born Oct. 31, 1854, he went to sea in youth, and was a master mariner when he took part in Nansen's journey across Greenland in 1888. In 1893 he commanded the Fram in Nansen's polar expedition, and when Nansen made his dash for the Pole

in 1895, Sverdrup was left in charge of the vessel, and by masterly seamanship brought her

safely home. He attempted to circumnavigate Greenland, 1898-1902, but was stopped at Cape Sabine, and turned his attention to exploring Grinnell Land and Greely Fjord. In 1914-15 he undertook a voyage for the relief of missing Arctic explorers, and in 1920 commanded the ice breaker Sviatogor, lent by the British Admiralty to Norway, which went to the rescue of the Russian icebreaker Solovoi, ice-bound in the Kara Sea. He died Nov. 26, 1930.

Sverdrup Islands. Group of islands within the Arctic Circle, W. of Ellesmere Island, in lat. 80° N., long. 100° W., approx. They were discovered by Otto Sverdrup (*v.s.*). The islands were first claimed by Norway, but Canadian sovereignty was recognized in 1931, the Canadian govt. making a grant of money.

Swabia. One of the duchies into which medieval Germany was divided. The duchy lay between Franconia, Bavaria, and the Rhine, was at first called Alamannia, and afterwards Swabia, from the Suevi or Suebi. From the 10th to 12th centuries it was ruled by dukes, some of whom belonged to the famous family of Hohenstaufen. Broken up in the 13th century, it is now part of Württemberg, Bavaria, and Hesse. The name is still sometimes used generally for the district, and more precisely for part of Bavaria. Under its dukes Swabia was the most civilized part of medieval Germany. One of the circles into which that country was divided in 1512 was called the Swabian circle, this being practically coterminous with the old duchy. *See* Germany.

Swadlincote. Urban dist. of Derbyshire, England. It is 5 m. S.E. of Burton-upon-Trent, and has a rly. station. The chief buildings are the parish church and the town hall. Earthenware is made here and in the vicinity are coal mines. The urban dist. includes, in addition to Swadlincote, Church Gresley, Stanton, and Newhall. Pop. 20,305.

Swaffer, HANNEN (b. 1879). British journalist. He was born at Lindfield, Sussex, Nov. 1, 1879, and educated at Stroud Green grammar school. Joining the Daily Mail in 1902, he was for a time editor of the



Johann Sverdrup,
Norwegian statesman



Otto Sverdrup,
Norwegian explorer

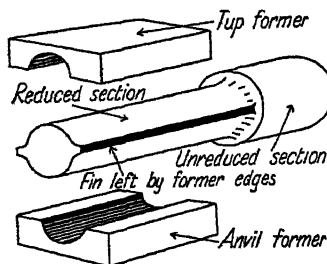


Hannen Swaffer,
British journalist

Weekly Dispatch, and later worked for almost all the London daily papers in turn. As dramatic critic of the Daily Express, 1926-31, he attracted attention by outspoken attacks on "third-rate acting." In 1931 he joined the Daily Herald, brusquely defending and debating on behalf of Socialism and spiritualism.

Swaffham. Urban dist. and market town of Norfolk, England. It is 111 m. N.E. of London, and 15 m. S.E. of King's Lynn, with a rly. station. The chief building is the parish church of SS. Peter and Paul, a Perpendicular edifice with a notable roof. There are a grammar school, a town hall, and a market cross. Cattle and sheep fairs are held, and there is considerable agricultural trade. Market day, Sat. Pop. est. 2,800. Near is Castle Acre, where are the ruins of a Cluniac priory founded in 1078. There are also some remains of a castle and this place also has a Perpendicular church. Swaffham Prior is a village, 8 m. from Cambridge.

Swaging. Process of forging, for reducing the cross-sectional shape and area to the desired



Swaging. Diagrammatic view of swaging blocks for a circular cross-section

dimensions between formers. The workpiece is held on the shaped anvil swage former with the appropriately shaped tup former held in line above it. Hammering or pressure is applied through the formers, and the section is squeezed down to the size given by the formers, the surplus metal causing the workpiece simultaneously to elongate. When one part is reduced as far as possible the work is moved to the next part and the process repeated until the desired length is produced.

Swahili (Arab., coast-people). Hybrid peoples, mostly on the coastlands and islands of Kenya Colony and the Tanganyika Territory. Numbering fewer than 1,000,000, and descended from the Muslimised medieval Zanj population, they represent twenty

centuries of Arab contact with the coast negroes, latterly recruited by slaves brought down from the interior. The most Arabised types, strongly built, and Semitic-looking, averaging 5 ft. 5 ins. in height, are well-educated, enterprising traders in the towns, especially Zanzibar. The lower ranks make good porters and seamen. Kiswahili, an archaic Bantu dialect interfused with Arabic, Persian, Indian, and European words, is the official language of East Africa. See Africa.

Swakopmund. Port in S.W. Africa. Situated in sterile country 25 m. N. of Walvis Bay, the harbour, an open roadstead exposed to S.W. winds, is now closed to commercial shipping. The town is also a popular holiday resort. Maize is grown in small quantity; but owing to the erratic rainfall the crop is unreliable. The town is well planned and lighted by electricity. There is a hospital maintained by a R.C. mission. Swakopmund is connected by rly. with Windhoek, the capital, and thence with Cape Town. It was occupied by the S. African forces on Jan. 14, 1915. Pop. 2,077.

Swale. River of the N. Riding of Yorkshire, England. It rises on the Westmorland border and flows 60 m. E. and S.E. through Swaledale and past Richmond to join the Ure a little below Myton. The two rivers then become the Ouse. Swaledale itself is considered by many to be the most beautiful of the Yorkshire dales, especially the upper part between the villages of Reeth, Gunnerside, Muker, and Keld. The absence of any rly. has kept the district from disfigurement.

Swallow (*Hirundo rustica*). Migratory bird of the family Hirundinidae. It is a native of Europe, Asia, and Africa, visiting Britain in April and staying till late in September. The upper parts



Swallow hovering as about to enter nest. W. S. Berridge, F.Z.S.

are uniformly blue-black, save for a patch of russet red on the forehead. The chin is also red, but the under surface in general is cream-coloured, with a deep collar of blue-black across the throat. The bill is broad and flat, and the tail

forked, more deeply in the male than in the female; the wings are very long. The bird is entirely insectivorous, its food being taken on the wing with rare exceptions. The saucer-shaped nest, constructed of mud mixed with grass and straw, is built usually upon a rafter or other shelf in barns or out-houses. It is lined with fine grass and feathers, and contains from 4 to 6 white eggs spotted with reddish brown. There are two broods each year as a rule. See Eggs colour plate.

Swallow Hole. Name given to the cavity resulting from solution of rock by water, and forming, or having formed, the entrance to an underground stream. Such holes are common in limestone regions and are also known locally as pot holes, sinks, etc. See Cave; Karst; Mole; Pot Hole.

Swallow-tail Butterfly (*Papilio machaon*). Large yellow and black butterfly, native of Europe



Swallow-tail Butterfly, found in the English fen country

and Asia. As a British species it is now restricted to the fens of Norfolk and Cambridgeshire. The hind-wings bear a round spot of rust-red at their lower angle, and from this a band of seven blue spots crosses the wing, which ends in a long curved black "tail." The green caterpillar is belted and spotted with black tinged with blue. When annoyed, the full-grown caterpillar protrudes a pink V-shaped organ from behind the head, which emits a strong odour, apparently of a protective nature. It feeds upon milk-parsley and other umbelliferous plants. The yellowish chrysalis is attached to the food-plant. See Butterflies colour plate.

Swallow-wort (*Asclepias*). Genus of perennial herbs belonging to the family Asclepiadaceae, natives of America. Other names for them are milkweed and silkweed. They have a milky juice, and the leaves are usually opposite or in whorls. The flowers have the corolla deeply divided into five segments. Attached to the tube of the

stamens are 5 hooded bodies each with a hollow horn. The pollen unites into masses (pollinia) as in the orchids, and these become attached to visiting insects. Several of the species are used medicinally; others yield fibres.

Swammerdam, JAN (1637–80). Dutch naturalist. He was born at Amsterdam, Feb. 12, 1637, and qualified in medicine at Leyden university. Specialising in entomology, his *History of Insects* was the standard work of his day. He died Feb. 15, 1680.

Swan (*Cygnus*). Small genus of large aquatic birds of the family Anatidae. They are natives of

mute swan—the only species that nests in the British Isles—constructs a huge bed of flags and reeds, lining it with down, and lays from five to ten greenish white eggs. The young swans, or cygnets as they are called in their first year, are of a grey-brown colour until they are a year old.

Lord Ilchester's swannery at Abbotsbury, Dorset, is famous as the largest swan community in Great Britain; and there is another in a backwater of the Wey, near Weymouth. The swans on the upper Thames are claimed by the crown and the Dyers' and Vintners' companies of the City of London.

In July representatives of these owners hold a swan-upping ceremony, when the cygnets, or "clear-bills," have their bills cut with distinguishing patterns. The male swan is known as a "cob" and the female as a "pen." Others well-known are the trumpeter (*C. buccinator*) of the Arctic Circle, and the red-billed

black swan (*C. atrata*) of W. Australia. See Bird.

Swan. River of W. Australia. It rises as the Avon and flows N.W. and then S.E., entering the Indian Ocean at Fremantle, 12 m. below Perth. Here, in 1829, was founded the Swan River Colony, from which W. Australia was formed. A swan has been retained as the symbol of W. Australia.

Swan, ANNIE S. (1860–1943). British novelist. She was born at Mountskip, Gorebridge, and educated at Ladies' College, Edinburgh. After a period of writing for magazines, she achieved her first success with a novel *Aldershyde*, 1893, the prelude to many sentimental tales of domestic life. Her last novel, *The Road to Damascus*, and her autobiography, appeared in 1937. She married Dr. James Burnett Smith, who died in 1927. Annie S. Swan died June 17, 1943.

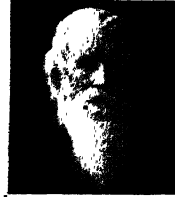


Annie S. Swan,
British author

Swan, JOHN MACALLAN (1847–1910). British sculptor and painter. Born at Old Brentford, he studied at the Worcester, Lambeth, and R.A. schools, and in Paris under Gérôme and Fremiet. Chiefly a painter and sculptor of animals, he was also an accomplished painter of the human figure. He became A.R.A. in 1894, R.A. in 1905, and died in London, Feb. 14, 1910.

Swan, SIR JOSEPH WILSON (1828–1917). British inventor.

Born in Sunderland, Oct. 31, 1828, and educated privately, he became assistant to a firm of manufacturing chemists in Newcastle. His improvements in methods of photography included, 1862, the carbon



Sir Joseph Swan,
British inventor
Russell

process. It is in electric lighting, however, that he became famous. Although he constructed a carbon filament lamp in 1860, it was not till 1880 that he exhibited the first successful carbon filament vacuum lamp bearing his name. He died May 27, 1917. See Lighting.

Swanage. Urban dist., seaport, and holiday resort of Dorset, England. It stands facing E. on the S. side of Swanage Bay, 24 m. by rly. and half as far by ferry S.S.W. of Bournemouth. There is an ancient church, S. Mary's, with a notable tower. The façade of the town hall was designed by Wren and erected for the Mercers' Hall, London; the clock tower near the pier was first set up at the Surrey end of London Bridge in honour of the duke of Wellington. Several other relics of old London have found a home at Swanage, notably the street



Swan. This graceful bird posed to show off its distinguishing features: the berry, as the base of the bill is called; short, strong legs and broadly webbed feet

many regions, extending from the Arctic to Australia. Closely related to the ducks and geese, they are distinguished by the extremely long necks, short legs, and the absence of feathers on the face from the eye to the bill. Three species visit the British Isles in winter, and of these one known as the mute swan (*Cygnus olor*) has lived in the U.K. in a semi-domesticated state for centuries.

According to tradition, the birds seen in swanneries and on ornamental waters are the descendants of tame swans introduced from Cyprus in the days of Richard I, but there is no evidence of this. The chief distinguishing mark of the mute swan is the prominent black knob at the base of the black-margined orange bill. It also holds its wings slightly raised and its neck arched when swimming. The hooper or wild swan (*C. cygnus*), which has the basal half of the bill yellow and the remainder black, keeps its wings pressed to its body and its neck straight. Bewick's swan (*C. bewicki*) is a smaller bird, with the yellow at the base of its black bill extending no farther than the nostrils. The



Swanage, Dorset. The old cottages near the ancient parish church of S. Mary

lamps. There is a little shipping with regular summer steamer service to Bournemouth, but the main



industry of the district is the quarrying of Purbeck stone. The place has good bathing and yachting facilities. Near are the Tilly Whim caves,

said to have been the resort of smugglers, but actually the result of stone quarrying. Pop. 6,276.

Swan Lake (Fr. *Lac des Cygnes*). Ballet in four acts, with music by Tchaikovsky and choreography by Petipa. It was the composer's first ballet (1876) and the first of its kind produced in Russia, only the ballets in operas being previously known to theatre audiences. It figured in the imperial theatre repertory after 1878, and was made internationally popular by the Diaghilev, de Basil, and Sadler's Wells cos. The prima ballerina has an exacting double rôle as a princess and the leader of the swans.

Swan Mussel (*Anodonta cygnea*). Fresh-water bivalve mollusc of the family Unionidae. It is found in sluggish rivers, canals, and large ponds throughout most of Great Britain. Commonly from four to six inches long, but often much larger, it has a thin shell, oval in shape, except that the hinge uniting the two valves makes a straight line on the upper side. Externally it is greenish-yellow marked with the dark growth lines, but within it is coated with pearl. The greyish animal has a large yellow foot, by the aid of which it moves over the bottom or sinks into the mud. The eggs are retained until they hatch, when the young in a larval form are discharged into the water. At this stage they have a temporary shell with a hook to each valve, which enables them to cling to the fins of fishes and so get distributed. When the permanent shell has formed within the larval valves, the young swan mussel sinks to the bottom. See Mollusca; Mussel.

Swanscombe Skull. Name given to occipital and left parietal bones of a human skull found in a gravel pit by the lower Thames at Swanscombe, Kent, in 1935-36. The



Swansea, Glamorganshire. The Civic Centre. Upper picture, the university building

gravel belongs to the epoch between the 2nd and 3rd glaciations (Mindel and Riss) of the Pleistocene, and flint implements found in it prove that the human remains are those of the Middle Acheulian group of early Palaeolithic man.

Swansea (Welsh, Aber Tawe). County and mun. bor. of Glamorgan, Wales. The seat of a university, it stands on Swansea Bay at



Swansea Ware. Sugar bowl, with cover and stand, decorated with flowers in natural colours

the mouth of the Tawe, 200 m. from London and 45 m. W.N.W. of Cardiff. It is served by rly. The bor. includes the watering-place called the Mumbles, and has an area of 24,241 acres. The buildings include the churches of S. Mary and S. John, both rebuilt in the 19th century, and many other places of worship. Secular edifices are the buildings of the University

College, the Royal Institution of S. Wales with library and museum, art gallery and museum, technical college, and a grammar school founded in 1682. The panels painted by Frank Brangwyn as part of a memorial to members of the house of lords who fell in the First Great War, and intended to adorn the walls of the royal gallery of that house, hang in the new guildhall. Numerous parks and open spaces provide extensive facilities for sport and recreation. Some parts of the castle still stand. Chief industries of Swansea are the manufacture of tinplate and the smelting of copper, zinc, silver, and other metals.

Coal is exported and there is some fishing. Other industries are refining oil, for which there are large storage facilities, the manufacture of patent fuel, engineering works, and flour mills.

Swansea grew up around a castle, one of those built in the peninsula of Gower by its Norman conquerors, and was a borough in the 12th century, and a seaport then or soon after. In the 18th century the smelting of copper was introduced, and about the same time coal began to be exported. Extensions and improvements of the harbour followed, and canals were dug for the conveyance of the coal. Swansea was heavily damaged by German air raids on the nights of Feb. 19, 20, and 21, 1941, much of the principal shopping district being destroyed. Two members are returned to parliament. Pop. 164,797.

Swansea Ware. Porcelain produced at the Cambrian Works, Swansea. It is remarkable for its dark blue and its beautiful paintings of birds, flowers, etc. The mark is a trident with the word Swansea. See Pottery.

Swan Theatre. Former London theatre. Partly owned by Henslowe (q.v.), it stood near the Surrey end of Blackfriars Bridge, and was opened in 1598. One of the largest of the Elizabethan playhouses of London, it was suppressed on the outbreak of the Civil War, and later demolished. See Bankside.

Swanwick, ANNA (1813-99). British translator. Born at Liverpool, June 22, 1813, she was educated at home and in Berlin. In 1843 she published her *Selections* (1st vol.)



Anna Swanwick, British translator

from the Drama of Goethe and Schiller, followed, in 1850, by another volume. Her best-known work is a translation of Faust, the two parts of which appeared in 1878. Her translation of Aeschylus appeared in 1873. She helped to found Girton College, Cambridge, and Somerville College, Oxford, and died Nov. 2, 1899. *Consult* Life, M. L. Bruce, 1903.

Swastika (Skt., well-being). Symbol formed of an equal-armed cross whose extremities are bent



Swastika, an ancient Aryan symbol

uniformly at right angles. One of the oldest of man's symbols, it has been found on rock carvings of the most primitive communities. Although traced in pre-Aryan Europe, it became essentially a symbol of the Aryan sun god. It occurs on Greek, Cyprian, Etruscan, and Roman vessels, on idols on the site of ancient Troy, on the beadwork of N. and S. American Indians, and was used as a tribal device among aboriginals of Australia and Africa.

Often occurring in the Far East, the swastika was a common design for pagoda railings among the Chinese. It was incised on blocks of the Minoan palaces of Phaestus, and on Neolithic pottery of Italy, France, and central Europe. It was a common motif in ancient Hebrew decorations. Under the name of fylfot, the swastika has for centuries been used in heraldry.

Kipling had the swastika embossed on the covers of his publications. Because of its Aryan associ-

ations, the swastika was adopted by Hitler as the symbol of the Nazi party, and after he assumed power it was incorporated in the German flag. Unlike the early (masculine) symbol, the arms of which are generally bent to the left, the Nazi (feminine) form of swastika had its arms turned to the right.

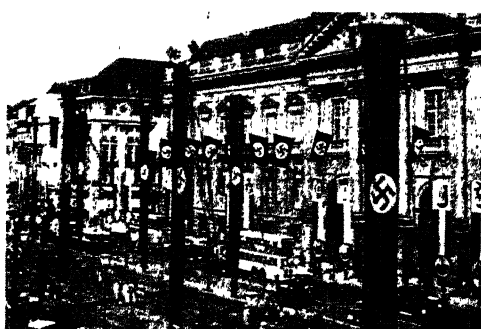
Swat. River and state in the N.W. Frontier prov. of Pakistan. The river (anc. Swastos) rises near the border of Kashmir and flows S. and S.W. to join the Panjkora. Its fertile valley, 70 m. long, yields rice, a system of canals irrigating 250 sq. m. Here dwell the Yusufzi Pathan Swatis. From Chakdara, a military post, a road goes N. into Chitral and S. to the Malakand Pass. The state of Swat acceded to Pakistan in 1947. It covers 4,000 sq. m. and has a pop. of 446,014.

Swathe. Line of grass or corn cut by the scythe. A swathe turner is a machine for lifting and turning over swathes on the hayfield, usually dealing with two at once. It has either blades or prongs which work spirally, or prongs that work over a couple of pulleys. *See* Hay.

Swatow. Former treaty port in Kwangtung prov., China. Situated at the mouth of the Han river, it was opened to foreign trade in 1860. Sugar is the principal product, but the trade has steadily diminished in favour of general merchandise from the southern provs. Swatow has been the centre of a stream of emigration to Malaya, the East Indies, Cochin China, and Siam. Pop. 119,168.

Swaziland. British S. African protectorate. It lies between the Transvaal on the N., W., and S., and Mozambique and Zululand on the E., and has an area of 6,704 sq. m. The country gradually rises from bush-covered malarial ground, with an average alt. of 1,000 ft., to a well-watered plateau at 4,000 ft. It is traversed by the rivers Umbuzi, Komati, and Usutu.

Swaziland is administered by the British high commissioner in S. Africa responsible to the Commonwealth Relations office in London. He is represented by a resident commissioner assisted by an advisory council in matters relating



Swastika. The Nazi version of this ancient emblem on blood-red banners and flags decorating the Unter den Linden, Berlin, in 1933.

to the whites. The native chiefs have limited powers. There is a customs union with the Union of S. Africa. Swaziland is a backward country with a low standard of living for both black and white. There are six European, three Eurafrican, and 198 native schools, but few natives are literate in English. Agricultural products include maize, cotton, tobacco, groundnuts, and beans. The country is believed to contain undeveloped mineral resources; small quantities of gold and tin have been worked, and the production of asbestos at Emlembe has an export value of about £1,000,000 a year. Mbabane, the administrative capital, is situated at an alt. of 4,300 ft., and Bremersdorp, the former capital, is in the middle veld. Pop. 186,880. (2,871 Europeans). *Consult* The Swazi, B. A. Marwick, 1940.

Swearing. Act of making declaration upon oath. Profane swearing or cursing is punishable by fine under the Profane Oaths Act, 1745. The fines, which may be summarily imposed, range from 1s. for a day-labourer, soldier, or seaman, to 5s. for a gentleman. The use of profane language in the streets renders the offender liable to a fine of 40s. *See* Oath; *consult* Lars Porsena; the Future of Swearing, R. Graves, 2nd. edn., 1927.

Sweat. Moisture from the skin. Sweat glands are scattered over the whole surface of the skin and most numerous on the palms and soles. Each consists of a coiled tube, which begins in the deepest part of the skin and passes up to the surface. Their most important function is to assist in the regulation of the temperature of the body by increasing or decreasing the amount of sweat secreted. This evaporates from the surface of the skin, with resulting coolness. By analogy the word has come into use as a synonym for drudgery. *See* Skin.



Swan Theatre, London. Sketch of the interior made by J. de Witt, a Flemish traveller, who visited London in the early 17th century. The arrangement of stage, orchestra, and accommodation for the audience is clearly shown

Sweater. Woollen jersey, as worn by athletes, usually to prevent cold after exertion. The name is due to the fact that the early sweaters were heavy woollen garments worn during training, in order to induce perspiration, and therefore to reduce weight. Men who sweat or reduce the weight of coins are known as sweaters, a name also applied to ruffians of the 18th century who annoyed persons in the street. See Coining.

Sweating. Term applied in the later decades of the 19th century to the practice of getting work done at minimum rates of pay through the medium of middlemen employers. The practice was particularly common in certain occupations, e.g. the clothing and furniture trades. The work was given out by large firms to middlemen, who accepted low prices and made a profit on them by "sweating" the actual workers. Most of the work was done in the homes of the poor under the worst conditions, and a select committee appointed by the house of lords in 1888 revealed a grave and widespread

social evil. Substantial improvement was effected in all sweated trades by the setting up of trade boards, which fixed a minimum wage. See Trade Board; Wages.

Swede or **SWEDISH TURNIP** (*Brassica campestris*, var. *napobrassica*). Root crop, a variety of



Swede. Root of the cultivated tankard variety

turnip. It is hardier and possesses greater feeding value than the ordinary turnip, from which it is distinguished by smooth bluish leaves and the presence of a narrow "neck" at the top of the root. Cultivated forms are the green-top, bronze-top, and purple-top, the last includes those known as tankard, intermediate, and globe. Its cultivation is the same as that of the ordinary turnip (q.v.).

SWEDEN: ITS HISTORY AND RESOURCES

A. D. Innes, M.A., and Edgar Stern-Rubarth, Ph.D.

See the articles on the cities, lakes, rivers, etc., of Sweden; also on her kings, statesmen, scientists, explorers, and men of letters, e.g. Gustavus Adolphus; Hedin; Nobel; Oxenstierna; Strindberg. See Europe; Scandinavia; Thirty Years' War

Sweden comprises the E. and S. parts of the Scandinavian peninsula. It is bounded W. by the



Sweden arms

Sound, the Kattegat, and Norway, N. by Finland, and E. and S. by the Baltic Sea. The islands of Gothland and Öland in the Baltic and Hven in the Sound belong to Sweden. The length of the boundary with Norway is 1,027 m., and with Finland 330 m. The total area of the country is 173,378 sq. m., and its length is 975 m. The coastline, with its numerous indentations, is about 4,700 m. long. Stockholm is the capital. Pop. of country, 6,763,685.

Sweden may be divided physically into three parts, which correspond approximately with the three ancient divisions of the country, Norrland, Svealand, and Götaland (Gothland). The characteristics of these divisions may be summarised: The highland district of the N., which includes all the frontier regions with Norway and Finland, rises from sea level to

over 3,000 ft., and occupies half the area of Sweden. The highest peaks in the country lie near the Norwegian frontier. The country slopes gently towards the Gulf of Bothnia, and there are many long rivers, which are of great value on account of their water-power resources, and also for floating timber to the sea. In this part most of the mineral wealth occurs.

The lowlands of central Sweden stretch across the country, in its widest part, from Norway and the Kattegat to the Baltic. They link



Sweden. National and merchant flag. Blue with yellow cross

the low coast of the highland region to the plains of Scania. Their average elevation is 300 ft.; heights of over 600 ft. are rare. The great lakes of Sweden, Vener (Vänern) (2,140 sq. m.), Wetter (Vättern) (733 sq. m.), Mälaren (444 sq. m.), and Hjälmaren (185 sq. m.), lie in depressions in the central lowlands. The soil is fertile and all conditions are well suited to agriculture.

The climate shows considerable extremes even in the S. There is a short summer and a long, cold winter. The mean temp. of Stockholm in Feb. is 26° F. and in Aug. 62° F. Most Swedish seaports are obstructed by ice from Jan. to March. Ports on the Gulf of Bothnia are entirely closed from about Nov. to April or May; sledges can sometimes pass between Sweden and Finland by sea.

Forests of Scots pine, spruce, and birch cover about half the total area of Sweden. In Scania and along the shores of the Kattegat are beech and oak forests. Valuable peat bogs cover above 15,000 sq. m. Land animals include the bear, lynx, wolverine, wolf, fox, hare, badger, lemming, elk, roe-deer, and ermine, but beasts of prey and fur-bearing animals are rapidly diminishing in numbers. The reindeer thrives in the favourable north. Seals and porpoises occur in the Baltic. Bird life is abundant. Fishes include salmon, trout, pike, and perch. The Baltic waters contain several fresh-water species as well as the cod, some flat-fish, and herring.

CONSTITUTION AND GOVERNMENT.

The constitution, with modifications, dates from 1809. The king is an hereditary monarch and rules in association with the council of state over which he presides. The king has the right of veto and certain powers in initiating legislation. The councillors sit in the Riksdag, and are responsible to king and elected representatives.

The Riksdag consists of two chambers. The first has 150 members, who are returned for a period of eight years by electoral bodies chiefly composed of members of the county and municipal councils. One-eighth of this chamber is elected each year, so that there is never a general election. The second (popular) chamber with its 230 members is elected as a whole by universal suffrage (men and, since 1919, women) for four years. Proportional representation applies. In 1944 115 Social Democrats were returned to the second chamber; the election of 1946 brought Social Democratic membership of the first to 86.

Local administration is carried out by county and municipal councils (landsting and kommunalfullmäktige), the county council (landsting) elected by proportional representation. There are 24 läns or counties. Stockholm forms a separate administrative area.

The state church is Lutheran, to which practically all the popula-

tion belongs. Uppsala has an archbishop. Education is compulsory and free for children from 7 to 14 years of age. There are advanced technical schools at Stockholm and Gothenburg (Göteborg), while universities exist in Uppsala, founded 1477, and Lund, 1668. The army is recruited by compulsory service, and its war strength is about 400,000 men. The navy is for coast defence only, and there is a small air force.

INDUSTRIES AND TRADE. Rapid growth of the big towns since 1930 resulted from widespread industrialisation. Agriculture remains the chief occupation: its relative importance tends to decrease, but it still supports 40 p.c. of the pop. Only about 10 p.c. of the country is under cultivation, principally in Götaland and Svealand, but the forested half is a main source of Sweden's wealth. Crops in order of importance are oats, wheat, rye, barley. Large quantities of grain are used for cattle food. Potatoes, sugar-beet, and hay are grown. The dairy industry is increasing in importance. Cooperative factories produce good butter for export. Poultry farming and bee-keeping are widespread in the S., and many million eggs and much honey are exported annually. The breeding of farm and draught horses is important. Sheep and goat rearing and pig breeding are increasing. Reindeer are bred by the Lapps. Sea-fisheries are of less importance than in Norway, the catch in a normal year being about 120,000 metric tons. Swedish boats fish herring and eels in the Baltic, mackerel, herring, and cod in the Kattegat, and visit the fisheries on the Norwegian coast.

Minerals and Manufactures

The iron-ore deposits are among the most valuable in Europe. They occur principally in central Sweden and in Lapland near Lulea and Kiruna. Both magnetite and haematite are mined at Riddarhyttan, Dannemora, and elsewhere. In Småland there is an important mine at Taberg. Sweden produces about 5 p.c. of the world's total output of iron-ore, and over 85 p.c. of this is exported. The coalfields are small and produce comparatively poor coal. Good copper and zinc ores and manganese and molybdenum ores are worked. Graphite occurs in Lapland. Granite, etc., and marble are quarried.

The timber trade is of great importance in Norrland, where there are some 1,500 sawmills. Metal-working, machine construction, and timber industries flourish. The

principal manufacturing centres are Eskilstuna (steel, tools, machines), Motala (locomotives), Trollhättan (locomotives, engines, electro-metallurgical works), Domnarvret (steel), Jönköping (engines), Norrköping (engines, machines), Stockholm (machines, dairy apparatus, motors, bridges, telephone apparatus, etc.), Malmö, Gothenburg, and Helsingborg. Electrochemical industries are growing. Other manufactures are wood-pulp, paper, cellulose, matches, timber goods, textiles, and earthenware.

Swedish steamships, built at home, ply to all parts of the world. Coasting traffic is important. The mileage of rlys. is about 10,000.

Legislation in 1939 provided for state purchase of all lines. These are mainly in Svealand and Götaland with the exception of the central line to Gällivare, the coast line to Haparanda on the Finnish frontier, the Lapland rly. to Narvik (Norway), and to Trondhjem (Norway). There is a through line to Finland, and train ferries run to Germany and Denmark. Electrification is advanced.

HISTORY. The Scandinavian branch of the Teutonic stock is divided into four principal race sections, Danes, Norwegians, Swedes, and Goths, who drove the pre-Aryan Finns into the far N. of the Scandinavian peninsula, and to the E. of the Baltic. The Swedish nation is formed from the blending of Swedes and Goths. The Swedes, having their seaboard in the Baltic, directed their raiding activities against the lands bordering on the inland sea, whose populations were most remote from Western and Latin influences. Hence they did not prominently attract the attention of the Western chroniclers, and their development was not urged forward by



Sweden. Map of the kingdom occupying the eastern portion of the Scandinavian peninsula

contact with the more advanced peoples. In spite of the efforts of the missionary Ansgar in the 9th century, it was not till the 11th century that Christianity began to take root among the Goths, nor was it fully accepted by the Swedes proper until the reign of S. Eric in the 12th century.

Comparatively early we find a Swedish king, Olaf Skotkonung, first fighting with Sweyn Forkbeard of Denmark (q.v.), then uniting with him to overthrow Olaf Trygvesson of Norway, and finally ejected from the portion of Norway which he had acquired by S. Olaf the Thick, about 1015. The line came to an end in Sweden in 1061, and there ensued a prolonged struggle between Goths and Swedes, who for a time elected the king alternately, the two races representing the old paganism, which died very hard; and the new Christianity.

Christianity triumphed with the reign of S. Eric, who was murdered in 1160. After this the advance of the Church in Sweden was rapid. Eric also, in the desire to spread

Christianity, began the conquest of Finland, which was completed a hundred years later by the great jarl Birger, acting at first as the minister of Eric XI. On Eric's death, Birger, who had married his sister, continued to rule till his own death in 1266, in the name of his son, Eric's nephew Waldemar. Birger is one of the great figures of the 13th century. Under him Swedish commerce advanced greatly, and the old antagonism between Goth and Swede rapidly disappeared.

Waldemar, first of the Folkunger dynasty, proved incapable and had to make way for his brother Magnus, who strengthened the power of the crown against the nobility, whose independence was the persistent disintegrating factor of the Middle Ages, which all strong kings set themselves to curb. Magnus was the protector of the peasantry, though he did not seek to balance the political power of the nobles by fostering that of the commons. During the minority of his son and successor Birger, the government was in the capable hands of the marshal Tyrgils Knutsson; but through the plots of the recalcitrant nobles Knutsson was put to death in 1306.

In 1319, Birger was deposed in favour of his three-year-old nephew Magnus II, who soon afterwards succeeded to the crown of Norway, being, through his mother, the grandson of Haakon V. The crowns were again separated in 1343, when Magnus was compelled to transfer that of Norway to his son Haakon. Twenty years later Magnus was deposed, and the Swedish nobles elected Albert of Mecklenburg king. The country fell into complete disorder, a sort of feudal anarchy, and Margaret of Denmark was called in. That able princess established her own supremacy and procured the union of Kalmar, 1397, which secured the crown of all the three Scandinavian kingdoms to her nephew Eric.

The succession of the house of Oldenburg in Denmark in 1448 resulted in a partial separation, since the Swedes elected one of their peers, Karl Knutsson Bonde, as their king, and the Oldenburgs

succeeded in establishing their own supremacy only during brief intervals, the effective domination of Sweden passing after 1470 to the Sture family, who acted nominally as regents, but actually as representatives of Swedish resistance to Danish domination. In 1520 Christian II of Denmark vanquished the Stures and sought to establish his supremacy by a massacre of nobles and others, known as the Blood-bath of Stockholm. The young Gustavus Vasa then headed a revolt, which resulted in the expulsion of the Danes and his own election as king of Sweden on June 6, 1523. Under Gustavus, who reigned till 1560, the independence of Sweden was established, its monarchy made hereditary, and the Reformation carried through.

Descendants of Gustavus Vasa

Of the three sons who ruled after him in succession, Eric XIV and John were by no means worthy of their father. Eric was deposed by John, who married a Polish princess and favoured a Catholic restoration. In the natural course, his son Sigismund, who became king of Poland in 1587, succeeded also to the throne of Sweden in 1592; but after his attempts to create a Catholic ascendancy, the Swedes in 1595 elected Charles, third son of Gustavus Vasa, to the position of regent or viceroy, and in 1604 he became Charles IX in Sigismund's despite. In 1611 Charles was succeeded by his son Gustavus Adolphus (q.v.).

In the reign of Gustavus Adol-

phus, aided by ministers of first-rate ability, but he chiefly won renown by the redoubtable part he played in the Thirty Years' War.

The close of that war in 1648 left Sweden in possession of Pomerania and extensive territories on the E. shores of the Baltic. Gustavus was succeeded by his favourite daughter Christina, who, having adopted the R.C. religion, resigned her crown in 1654 in favour of her cousin Charles X. That monarch plunged into wars, conducted with extraordinary brilliancy, against Poland and Denmark; but his career was cut short by his early death in 1660. The long minority of his son Charles XI brought disorganization and threatened a collapse of the Swedish power. Then the young king set himself to reorganization with marked success. In 1697 he was followed by his son Charles XII, whose amazing military achievements were nullified by his disastrous defeat at Poltava, and the greatness of Sweden ended with his death at the siege of Frederikshald in 1718. The peace of Nystadt, 1721, which ended the struggle between the Baltic powers, left Sweden with no possessions on the continental side of the Baltic S. of the Gulf of Finland.

Charles XII, dying childless, was succeeded by his sister Ulrica Eleonora, whose husband Frederick of Hesse was crowned king in 1720. Their accession was made conditional upon stringent limitations of the powers of the crown.



Sweden. 1. A peasant farmer from the prosperous agricultural area of Dalecarlia. 2. Peasant girl from the same district in national costume. 3. A north country family in heavy winter dress

phus (1611-23), Sweden entered upon her brief career as a first-class military power. The supremacy of the crown based upon popular support, established by Gustavus Vasa and to a great extent lost under his two immediate successors, had been restored by Charles IX. It was more than confirmed by the genius of Gustavus Adol-

The accession of Gustavus III in 1771 wrought a decisive change. Forestalling his enemies, by a *coup d'état* in 1772 he arrested the chiefs of the nobility, and procured from the national assembly the acceptance of a constitution, which virtually conferred upon him absolute powers, to the satisfaction of the people at large, who had

gained little enough from party struggles of factions like the "Hats" and "Caps."

His son Gustavus IV seized the worst possible moment for defying Napoleon and the tsar of Russia in 1808, and the Swedes, finding themselves in extreme danger, deposed him, set his uncle Charles XIII on the throne, and made terms with their dangerous enemies. In 1810 the French marshal Bernadotte was nominated as crown prince and heir. He actually assumed control of the government, and in 1813 joined the coalition against France. He utilised the fall of Napoleon to wrest Norway from Napoleon's ally Denmark, and from 1814 to 1905 Norway was attached to Sweden, autonomous but not independent, at least as concerned foreign relations. Bernadotte himself became Charles XIV in 1818, and his dynasty still occupies the throne of Sweden, though the union between that country and Norway was repealed in 1905.

In the Two Great Wars

Under Charles XV (1859-72) the legal system and the liberty of economic activity were established and the present constitution with two chambers was inaugurated. Oscar II (1872-1907) tried in vain to prevent the separation of Norway. In 1909 the general electoral rights and the proportional system of elections were introduced, after Gustavus V had begun his long, beneficent rule. Sweden upheld her neutrality in both Great Wars. In 1921 the Aaland Islands in the Gulf of Bothnia were allocated by the League of Nations council to Finland. Sweden was a staunch supporter of the League; but the possibility of menace from Soviet Russia or Germany led to close military cooperation between the Scandinavian countries, a strengthening of their defences, and from 1932 a partial customs union. The question of remilitarising the Aaland Islands, whose people desired union with Sweden, was under discussion between Sweden and Finland when the Second Great War broke out.

During the Second Great War Sweden maintained neutrality, engaging, however, in relief work, e.g. she fed many Norwegian children, gave asylum to some 50,000 war refugees, and assisted in the exchange of wounded prisoners of war between Germany and the Allies. (See also under Skagerrak.) It was a Swedish citizen, Count Folke Bernadotte

(*q.v.*) who transmitted to Great Britain and the U.S.A. Himmler's offer of German capitulation, April 29, 1945. After the cessation of hostilities Sweden welcomed 10,000 forced foreign workers from Germany for rehabilitation.

LANGUAGE, LITERATURE, AND ART. The ancient Nordic literature was common to the peoples later splitting into the different Scandinavian nations, and closely related to the Icelandic and the Anglo-Saxon epics. Though the Swedish language differs in spelling and pronunciation considerably from Danish and Norwegian, and after the Reformation was affected by German elements, the three tongues are mutually intelligible. The oldest documents were transmitted in Runic writing; apart from Latin religious and legal literature, Swedish poetry and prose did not arise before the 13th century. S. Bridget was the first author of lasting importance, in both Latin and Swedish. Bishop Thomas of Strängnäs (c. 1443) first displayed a national spirit. The Reformation affected thought and writing; the university of Uppsala was transformed into a Protestant one in 1595, and Luther's pupils, the brothers Petri, became the historians and poets of Sweden. Gustavus Adolphus and Christina founded universities at Dorpat (Tartu), Åbo (Turku), and Lund, attracted men like Descartes and Grotius to court, and favoured a literature in the Renaissance spirit. Bärbo, Stjernhelm, Dahlstjerna, Lars Johanson, Eurelius, and Rudbeck were poets and authors of the 17th century.

Eighteenth-Century Vigour

An intellectual recovery developed after the end of Charles XII's reign and the period of perpetual war. From the academy of science, founded 1730, came Linnaeus, Celsius, and Swedenborg. French influence made itself felt; Dalin, Gyllenborg, Wallenberg (influenced by Swift), and the gifted lyricist C. M. Bellman (1740-95) represent the period. Under Gustavus III, himself a poet and dramatist and founder of national opera and theatre, Kellgren, af Leopold, Thorild, and the poetess A. M. Lenngren became classics of the country's literature. After 1810 there was rivalry between Romantic and patriotic schools of literature; Esaias Tegnér (1782-1846, *q.v.*), Sweden's greatest poet, belonged to the second, and in Frithjofs Saga, 1820-25, gave expression to the national spirit. The Romantic

Stagnelius, Atterbom, and the historian and lyricist Geijer were his contemporaries; the novelist Cederborg, with humorous realistic stories, an independent figure beside him.

Bourgeois Liberalism prevailed from 1830, in Dahlgren, Almquist, Wennerberg in prose; Strandberg and the great J. L. Runeberg in poetry—the latter became Finland's national bard though he wrote in Swedish; and the protagonist of an ideal humanitarianism, V. Rydberg (1828-95). This rich and world-conscious literature preceded the realism of August Strindberg (1849-1912) and the earlier works of Geijerstam and Heidenstam, who in turn produced a new idealism and romanticism. Per Hallström, E. A. Karlfeldt, Birger Mörner, Sophie Elkan, the dramatist Hedberg, and many more establish a claim to international recognition. Selma Lagerlöf (1858-1940), who won a Nobel prize, ranks among the strongest literary personalities of her time.

Music, Architecture, Painting

There is a great musical tradition in Sweden, based since the 13th century upon folk melodies and ballads. Architecture was late in emancipating itself from Roman, Gothic, Baroque, and neo-classic foreign influence, but from about 1900 it shows in Westman's Stockholm town hall, Ericson's church in Gothenburg, and in many public and private buildings the development of a style. The same applies to sculpture since Carl Milles (b. 1875) turned away from French examples. Painting, however, by the later Middle Ages was showing national peculiarities. In the 17th century Dutch and German masters established in Sweden schools which gained international acclaim. The 18th century brought forth successful Swedish pupils of first the Düsseldorf, then the Paris school. With Prince Eugene, Liljefors, E. Jansson, and others was evolved a national school which, in Carl Larsson (1853-1919) and above all Anders Zorn (1860-1920), reached a standard vying with that of any other European country. French post-Impressionism has today a strong attraction for Swedish artists.

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Swedenborg, EMANUEL (1688-1772). Swedish scientist and religious writer. A son of Bishop



Emanuel Swedenborg, Swedish religious writer

Svedberg (q.v.), he was born at Stockholm, Jan. 29, 1688, and educated at Uppsala university, afterwards studying at Oxford, Utrecht, and Paris. He was appointed in 1716 an assessor in the royal college of mines. In 1719 the family was ennobled, assuming the name of Swedenborg. In the upper house he promoted many reforms, but devoted himself mainly to mineralogy and engineering. He published a series of works, the most important in 1734, on the general principles of science and philosophy. These studies anticipated a profound change in his views; and in 1744-45 he declared that insight into the spiritual world had been granted him by direct revelation. This was not mystical expression; he claimed to be describing as a reporter what he saw. Swedenborg abandoned his scientific work in 1747, and gave up the rest of his life to meditation and writing, living largely in Amsterdam and London, where he died March 29, 1772.

According to Swedenborg, who believed that in a state of trance he had free intercourse with spirits, there is an exact correspondence between the physical and spiritual worlds. Most books of the Bible have two senses, a literal and a spiritual. Everyone can exist on three planes; the celestial, of love, that of spiritual wisdom, and that of obedience, or the physical. Those who are actuated by love of God and man enter heaven as angels, those whose motive is self-love enter hell. All life flows from God. The Holy Trinity became incarnate in Jesus Christ, who raised humanity to union with God, but there is no atonement in the accepted sense.

Swedenborg claimed to inaugurate a new dispensation, but founded no sect. His teachings are, however, especially revered by the Swedenborgian body called the New Church (q.v.). His books include *Heaven and Hell*, *Divine Love and Wisdom*, and *Conjugal*

Love. Many were published in English by the Swedenborg Society, founded in 1810. Consult *Documents Concerning Swedenborg*, R. L. Tafel, 1875-77; *Life*, G. Trowbridge, new ed. 1932.

Swedish Drill. System of physical exercise originated in Sweden. It has evolved since the early 19th century. The benefits derived from the system have induced other countries to include it in the curriculum of physical training provided for the naval, military, and police forces. Often designated "free movements," the exercises are practised without apparatus. There are special exercises for the legs, arms, neck, spine, lungs (breathing exercises), balance or maintenance of the body's equilibrium, development of lateral trunk and abdominal muscles, and strengthening of the shoulders and back. See *Physical Training*.

Swedish Iron. A form of wrought iron produced from Swedish ore pig iron. Its purity has brought it into widespread use for high-grade tool steel manufacture. It is made from the pig iron either by the old Walloon process, in which the oxidation of impurities is accomplished without complete fusion, or by the Swedish Lancashire process, in which the temperature of oxidation is higher.

Sweeney Todd. Melodrama based on the career of a 17th century barber of that name. Known as the "demon barber" of Fleet Street, this character is reputed to have had his shop in an alley behind the Cheshire Cheese tavern. According to popular belief, Todd cut his customers' throats while shaving them, and cast his victims through a trapdoor into a cellar where they were speedily converted into pies and sausages. There were three dramatic versions: (1) *Sweeney Todd*; or *The Fiend of Fleet Street*, by George Dibdin, produced 1847, of which a revised version by Andrew Melville was

given at the Kingsway Theatre, 1927; (2) *The Barber of Fleet Street*, or *The String of Pearls*, by Frederick Hazleton, produced 1862; (3) *Sweeney Todd*, by Matt Wilkinson, produced 1870. The first of these was popularised by Tod Slaughter (b. 1885), who frequently appeared in the title part.

Sweepstake. Form of competing for money or other prizes. The money is contributed in equal proportion by each competitor, or by the owners of the various runners. In another variety of sweepstake, held upon horse races, there is no fixed number of subscribers; two sets of slips of paper are prepared, each in one set bearing a subscriber's name, the other set bearing the names of the horses, and blanks to the number of subscribers. Each set of slips is shuffled together and placed in a hat or box, from which they are drawn one at a time simultaneously from each set. See *Gaming*; *Irish Sweepstake*; *Lottery*.

Sweethread. Term given to certain glands of sheep and cattle when used for human food. The chief is the pancreas, while another is the thymus gland.

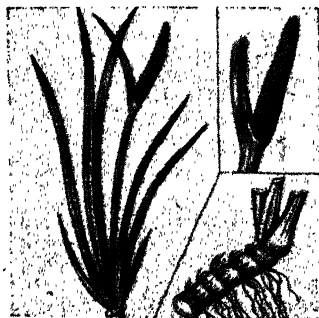
Sweet Briar or *EGLANTINE* (*Rosarubiginosa*). Shrub of the family Rosaceae. A native of Europe



Sweet Briar. Spray of flowers, buds, and sweet-scented leaves

and N. and W. Asia, it forms a small bush with erect prickly stems, clothed also with gland-tipped bristles. The leaves are divided into five or seven roundish leaflets with toothed edges. On the underside they are covered with glands, whose sticky secretion gives off the well-known sweet briar odour. The small rosy flowers are about 1½ ins. across, the scarlet fruits egg- or pear-shaped.

Sweet Flag (*Acorus calamus*). Perennial aromatic waterside herb of the family Araceae. It is a native of Europe, N. Asia, and N. America. It has a thick, creeping rootstock, and sword-shaped leaves



Sweet Flag. Aromatic waterside herb. Inset, top, flower spike; below, root

4 to 6 ft. long. The flowering stem is also sword-shaped, and ends in a flattened envelope (spathe), from which emerges the flower-spike (spadix) with hundreds of yellow-green simple flowers.

Sweet Gale (*Myrica gale*). Shrub of the family Myricaceae, also called bog myrtle (q.v.).

Sweetheart Abbey. Ruined Cistercian abbey in Dumfriesshire, Scotland. It was built by Devor-



Sweetheart Abbey, Dumfriesshire. Ruins of the abbey church where the heart of John de Baliol was buried

gilla in 1275 to commemorate her husband, John de Baliol, and at her death she ordained that his heart, enclosed in a casket of ebony and silver, should be buried with her. Thus arose the name Sweetheart Abbey (*Abbatia Dulcis Cordis*). The ruins comprise portions of the church and, $\frac{1}{2}$ m. E., the abbot's tower. Sweetheart Abbey and the village which has grown up around it are now known as New Abbey.

Sweet Lime. Popular name for the fruit of *Citrus limetta* to distinguish it from the *Citrus acida*, the W. Indian lime from which lime juice is obtained. It is a native of E. Asia. See Lime Fruit.

Sweet Pea (*Lathyrus odoratus*). Annual herb of the family Leguminosae. It is a native of S. Europe, whence it was introduced to Great Britain in 1700. Its long, flattened, and winged stem is too weak to stand, and the plant supports itself by numerous tendrils. The fragrant flowers are produced in clusters of two or three at the end of long stalks, and are of various tints—white, pink, and purple. Under cultivation the colour variation, as well as the size, has been increased, chiefly at the expense of the fragrance.

Sweet peas thrive in any garden soil, where they are sown usually from Feb. to April, though stronger and more vigorous plants are obtained by sowing in Oct. Many people prefer to sow in the greenhouse in spring, treating sweet peas as tender or half-hardy annuals—which they are not—and planting out in May. During dry periods they should be watered freely, and when flowering should be mulched with well-decayed manure. See Flower; Pollen.

Sweet Potato (*Ipomoea batatas*). Trailing perennial herb of the family Convolvulaceae. It is a native probably of S. America, but is grown extensively as a food crop in most warm countries. It has a long, slender stem which sometimes climbs by twining, large lobed or angular leaves about 6 ins. long, and funnel-shaped flowers which are white outside and purple within. It forms underground a large spindle-shaped tuber as a reservoir of starchy and saccharin matter. As usually cultivated these tubers weigh from 2 lb. to 12 lb. each, but by being left in the ground for a few years they may become 30 lb. or more.

The name potato for *Solanum tuberosum* is a corruption of batatas, the native name of the sweet potato. The latter was known in Europe at an earlier date than the common potato, and the two plants were often confused. The sweet potato is frequently cultivated in the U.K. under glass at a temperature of at least 60° F. The most suitable soil is a mixture of loam and leaf-mould, and propagation is effected by division of the tuber. For the table, it may receive treatment similar to that of the common potato (q.v.).

Sweets. A word of Anglo-Saxon origin. It is used principally to describe small sweet-tasting objects eaten for pleasure. The "honey of canes," mentioned by early classical writers, is the



Sweet Potato. Trailing stem of leaves and funnel-shaped flowers

sugar-cane, and the earliest sweet-makers, Indians, Chinese, and Persians, used it long before the Christian era. They also used honey, which continued to be the basis of European sweetmeats long after cane-sugar was known. Beet-sugar, maple-sugar, and glucose later became the important ingredients. Gums, gelatine, nuts, fruits, butter, and other fats are also used, with various natural and synthetic flavourings.

The making of sweets is the seventh largest industry in Great Britain; during the 1930s production was valued at £50,000,000 annually. Weekly consumption in the British Isles averaged 7-8 oz. per head of the pop.

Apart from chocolates, in bar or fondant form, sweets are classified as boilings, toffees, marzipans, and gums. Boiled sweets are made by boiling sugar and glucose, with flavouring, in large pans, and then mechanically cutting and shaping the product.

Toffees are similarly made, but contain butter and other fats. Marzipans contain, in addition to sugar, nut-paste; and gums (pastilles, jellies, etc.) are made from gum arabic, gelatine, or starch mixed with sugar or glucose and flavouring matter.

The word sweet is also used for puddings and similar sweet-tasting dishes eaten at lunch and dinner, while legally sweets has the special meaning of a fermented liquor containing fruit or sugar.

Sweet William (*Dianthus barbatus*). Perennial herb of the family Caryophyllaceae. It is a native of S. and E. Europe, when it was introduced to Great Britain about 1573, and became a favourite garden plant. The stiff, jointed stem bears lance-shaped leaves in pairs, and divides at the top into a cluster of flower-stalks. The flowers are naturally pink or white, but as the result of cultiva-



Sweet Pea. Leaves, flattened stem, and cluster of the fragrant flowers



Sweet William. Leaves and clustered flowers of a cultivated variety

tion innumerable varieties exist in all shades of crimson almost to black, zoned with other tints, and the edges variously toothed or fringed. They succeed in any garden soil, and may be propagated by seed, cuttings, layers, or division of the clumps. The last is the best method, and should be carried out in Sept. Otherwise the treatment should be the same as for the carnation (*g.v.*).

Swell. Wave motion in the ocean due to a distant disturbance. As long as the waves travel in deep water the swell may persist, without change in direction, for some time after the cause of the motion has disappeared. The height of the waves diminishes rapidly as they recede from the disturbance, but both length and velocity remain unchanged; hence the characteristic regular undulations. Observations of swell are useful in indicating the direction of the disturbance, *e.g.* a cyclone. *See* Wave.

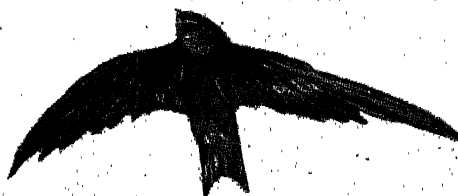
Swell. In the organ, a set of pipes enclosed in a chamber with Venetian shutters in front which can be operated by means of a pedal, thus producing *crescendo* and *diminuendo*. The swell was invented by Abraham Jordan and his son in 1712, and first applied by them to the organ in St. Magnus church, London Bridge. In this the opening was effected by a sliding shutter, the Venetian shutters being introduced only in 1765. The keyboard from which these enclosed pipes are played is called the swell manual, and stands just above the great manual. Swell pedals are of two kinds, either a simple lever which can be fixed down by a swinging rod, or balanced, which consists of a foot-board so adjusted as to remain in any desired position.

In the reed organ, a swell shutter is actuated by the knee. The principle of the swell was adapted to

the harpsichord about 1750, the lid being raised by a pedal. *See* Organ.

Sweyn (d. 1014). King of Denmark from 986 to 1014. The son of Harold Bluetooth (940–986) and father of Canute the Great, he made various conquests in Sweden and Norway, and several raiding expeditions to the British Isles from 994, exacting tribute from Ethelred the Unready. After Ethelred's massacre of the Danes, 1002, Sweyn invaded Britain again, and had conquered much of the country when he died at Gainsborough.

Swift (*Apus apus*). Bird of the order Apodiformes. A native of Europe, Asia, and Africa, it is



Swift. Summer migrant to the British Isles, with its long narrow wings spread in flight

famed for its rapid, steady flight and wonderful evolutions in the air. Save for a light grey patch under the chin, the plumage is sooty black and glossy; the wings are very long and narrow; and the tail is short and forked.

As a British bird it is a summer migrant, arriving at the end of April and departing in August. Its rather primitive nest, slightly contrived of straw, dry grasses, and feathers, gummed together by the bird's saliva, is built under the eaves of a house, in church towers, and cliff crevices—sometimes the sparrow's nest is requisitioned—and usually two white eggs are laid. The swift never perches, its short feet and hook-like claws enabling it only to cling to walls, etc. It is entirely insectivorous and hunts in companies, filling the air with joyous screams. The swift is unrelated to the swallow; its nearest affinity among British birds is with the nightjar. It is said to exceed 100 m.p.h. in flight. *See* Bird.

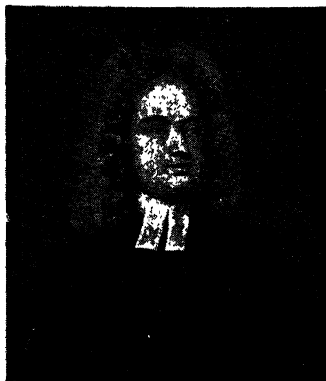
Swift, JONATHAN (1667–1745). British satirist. Born in Dublin, Nov. 30, 1667, son of a clergyman of English descent, he was educated at Kilkenny grammar school and Dublin university, where he graduated without distinction in 1686. During 1689–92 he was secretary, at Moor Park, Surrey, to Sir William Temple, whose wife

was a distant relative of Swift's mother; and was tutor to Esther Johnson, the Stella of his *Journal and Sonnets*. Through Temple's interest, he went to Oxford and took his M.A. degree at Hart Hall, July 5, 1692.

Ordained priest, 1695, he obtained the living of Kilroot, Belfast Lough, but returned to Moor Park, 1696–98. When Temple died, Jan., 1699, he left his amanuensis a legacy of £100 and the task of editing a collection of his works. While in Temple's service, Swift wrote *The Battle of the Books*, 1697, prompted by the controversy over the Letters of Phalaris (*see* Bentley, Richard).

This was published, 1704, with *A Tale of a Tub*, a brilliant satire on the divisions of Christianity, but a work that prejudiced his chances of ecclesiastical preferment.

Returning to Ireland, Swift became chaplain to the earl of Berkeley, rector of Agher, vicar of Laracor and Rathbeggan, and prebend of Dunlavin, 1699–1700. From 1700 to 1713 he was in London, where he met Addison, Pope, Gay, Harley, Ormond, Peterborough, Arbuthnot, Bathurst, Bolingbroke, and others, and engaged in political controversy. During this period he left the



Whigs for the Tories, edited *The Examiner*, and founded the Brothers' and the Scriblerus clubs. He was made dean of St. Patrick's, Dublin, Feb. 23, 1713.

While in England, which he visited again in 1726 and 1727, he

J. Swift

began his memorable friendship with Stella, whom he is said to have married secretly in Ireland about 1715, and who died Jan. 28, 1728. The friendship with Esther Vanhomrigh (Vanessa) began about 1710, and is related in the poem, *Cadenus and Vanessa*, which before her death in 1723 she entrusted to her executors for publication. Meanwhile he had written *Sentiments of a Church of England Man*, 1708; *Proposal for the Advancement of Religion*, 1709; his ironical *Argument Against Abolishing Christianity*; and his humorous pamphlets, signed Isaac Bickerstaff, on the almanac-maker, Partridge. His *Drapier Letters* (q.v.), 1724, written to expose an injustice to Ireland in connexion with the coinage, and *Proposal for the Universal Use of Irish Manufactures*, 1720, attest his hatred of oppression. His masterpiece, *Gulliver's Travels*, appeared 1726-27.

The hereditary gloom in Swift's nature, due in part to inherited brain trouble, which began to show itself soon after 1692, increased. The crisis came about 1740, and he died Oct. 19, 1745, being buried by Stella's side in S. Patrick's cathedral, Dublin.

Swift has been much misunderstood. He set his ambition, not on political or literary, but on ecclesiastical preferment, and was disappointed. His political views are summed up in the phrase: "Whoever has a true value for Church and State should avoid the extremes of Whig for the sake of the former and the extremes of Tory on account of the latter." He is one of the great masters of English prose. Juvenal was not a more scathing satirist. The *Journal to Stella*, certainly not written for publication, and published complete, ed. H. Williams, 1948, is proof of his genius for affection, as his break with Vanessa is of his sense of friendship's rightful boundaries. A voluminous writer, nearly all he wrote was issued anonymously; for Gulliver alone did he receive payment. He gave one-third of his income to charity, wrote his own epitaph, and left his remaining property to found a madhouse. See *Gulliver's Travels*; *Satire*; *Stella*.

W. F. Aitken

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1896; *Unpublished Letters*, ed. Birkbeck Hill, 1899; *Lives*: L. Stephen, 1889; H. Craik, 1894; S. Gwynn, 1933; W. D. Taylor, 1933; B. Newman, 1937; R. W. Jackson, 1939; B. Acworth, 1948.

Swift Moth (Hepialidae). Family of moths of very primitive structure. Their two pairs of wings are closely alike in form and venation. The caterpillars of the five British species feed below ground at the roots of grasses, low plants, and bracken: the pupae are very mobile, working their way to the surface when

ready to emerge as moths. The glistering white male ghost moth (*Hepialus humuli*) attracts the yellowish female by hovering over one spot at dusk. The male golden swift (*H. hectus*) attracts his mate by diffusing a strong scent.

Swilly, LOUGH. Inlet of the N. coast of co. Donegal, Eire. Its entrance, where it is 4 m. wide, is between Fanad Point and Dunaff Head, and it extends S. for about 25 m.: average width 3 m. It has two lighthouses. Formerly the R.N. had a base here. See Irish Bases.

SWIMMING: HOW THE ART IS ACQUIRED

See the articles *Artificial Respiration*; *Bathing*; *Channel Swimming*; *Diving*; *Drowning*; *Water Polo*, etc.; also biographies of famous swimmers, e.g. Burgess, T. W.; Temme, E. H.; Webb, Matthew

Swimming is the method of moving progressively on or through water, without artificial aid. The first book on swimming was written by Nicolas Winmann, a professor of languages at Ingolstadt, Bavaria, and published in 1538, and the first one in England by Everard Digby in 1587. For a long while the idea that the principles of swimming could be taught on land was ridiculed, but the work of the London schools swimming association, a voluntary organization started in 1893, and like work among school associations in all parts of England, led to appreciation of the idea, and the amateur swimming association now publishes complete instructions to this form of teaching, as does also the Royal Life Saving society for rescue and release work. The exercises are based as nearly as possible on the actual movements in the water, and experience has proved that the pupils gain confidence, and that as soon as they enter the water the majority swim automatically.

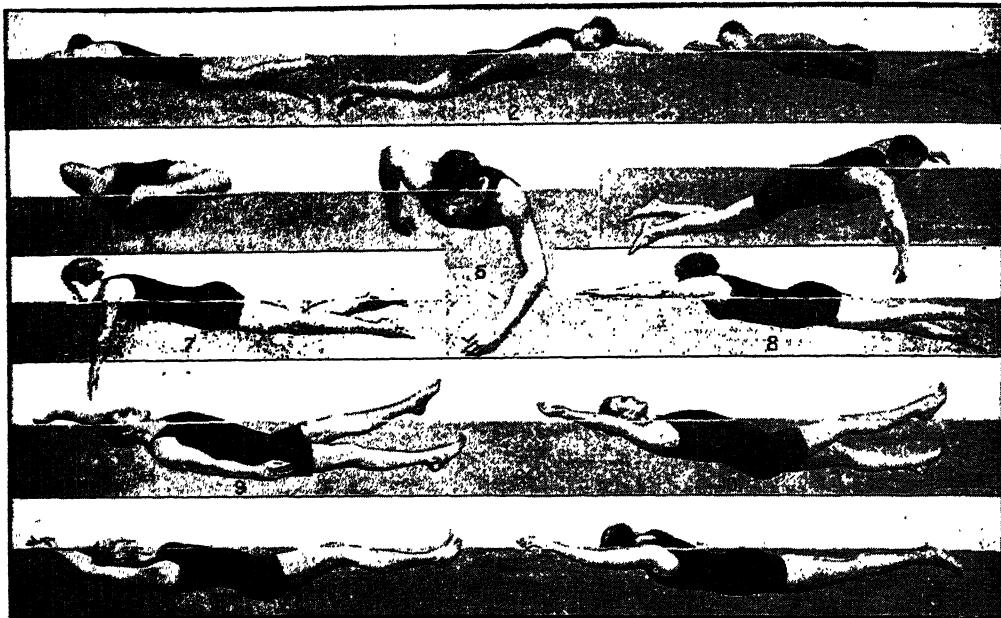
Importance of Breast Stroke

These instructions are for what is called the breast stroke, the most useful of the various methods of progression through the water but slow as compared with the "trudgeon" or the crawl. It is, however, the basis of swimming education, and once mastered it begets confidence never afterwards lost when one is in the water. The great fault with most beginners is hurried action of the arms, which affects respiration and quickly tires the performer. The legs should do most of the work.

In using the breast stroke, the arms should be bent in with the elbows about four ins. from the sides of the body, the hands touch-

ing, palms downwards at the level of the breast bone, the body inclined forward and the head slightly back. When the stroke is made, the arms are pushed forward to their fullest extent, vigorously but not with a jerk, and when fully extended the hands should be turned down, pulled in towards the trunk, and in a circular movement replaced with wrists resting on the breast bone ready to recommence the stroke. During this last portion of the movement, inward breathing should take place, the head being out of the water; exhaling into the water should occur with head down as the arms are pushed forwards at the start of the next stroke. The proper regulation of breathing is the all-important factor in swimming.

While the arms are in motion the legs have to act in unison with them, so as to produce the propelling power. At the time the arms are fully extended in front of the body before pulling towards the trunk, the legs should be in horizontal position, heels touching, just under the surface. As the pull is made they are opened and widened out at the knees, but the knees must not be drawn under the body. They are then kicked out quickly and brought together again as the arms are shot forward, and this combined action of arms and legs carried on in uniform manner constitutes breast-stroke swimming. The back stroke, useful in the saving of life, is in its primary movements merely the breast stroke performed on the back, but there are many variations of it, and the practice of it is useful in learning the art of floating. The "overhand" or "overarm" stroke was formerly considered the fastest, a



Swimming. Diagrams showing positions of the body and limbs in different strokes. 1-6. American crawl: 1. Correct position of body. 2. Preparing to inhale. 3. Left arm being withdrawn from water. 4. Hand entering water. 5. Direction of pull. 6. Left hand ready to enter water. 7. Trudgeon crawl, middle of arm drive. 8. Correct position for trudgeon crawl with left arm ready for drive. 9 and 10. American back crawl, beginning of stroke with left and right arm respectively. 11 and 12. Position in floating, with face upwards and downwards respectively.

stroke known as the "trudgeon," introduced to England by J. Trudgeon in 1875, being considered speedy only for short distance. But with the advent of water polo an adaptation of his stroke became popular, and distance swimmers took advantage of it. Then in 1902 R. Cavill, an Australian swimmer, gave an exhibition of the crawl stroke, and this method of progression has since revolutionised speed swimming.

The Australians, Americans, and English all have different styles of this new stroke, which differs in underlying principles from the breast, overarm, and trudgeon strokes. The swimmer lies nearly flat upon the surface of the water, stretches out his arms alternately in front of the head, which is low down in the water, dips his hands in the water and pulls the arms smartly back and sweeps them down the side of his body, with the palms turned slightly outwards. His leg movements are similar to those one would use if walking backward. The legs are kept close together, are swung up to the surface alternately and then thrashed out with a strong downward kick. The stroke is so timed that the right arm and left leg and left arm and right leg work in unison, the leg being ready to make the thrash as the arm is starting for the pull.

Breathing in the crawl stroke is very important, and if incorrect can decrease the speed of the swimmer; the head should be turned either to the left or right side, inhaling as that arm reaches the surface of the water behind the body, and breathing out into the water, with face downwards, as the arm is brought along the surface in front.

The back-crawl is similar to the crawl except that the swimmer is lying on his back on the surface of the water, and it is not necessary to turn the head to either side for breathing; intake of breath can coincide with the flinging back of either arm.

The butterfly breast stroke is more powerful and speedy than breast stroke. With the customary wide, out-and-together breast stroke leg action the swimmer performs with the arms a movement similar to that used in the crawl stroke, but instead of driving alternately, the arms are pulled together and swept back together. The hands enter the water in front of the shoulders, wide apart; the drive is down and back with the arms bent a little at the elbows. The arms are then flung quickly but loosely and without pause over the surface to the point of entry. Inhaling takes place through the mouth as the arms drive down,

and exhaling with the mouth submerged during the remainder of the stroke. The leg drive follows the arm drive.

1948 OLYMPIC RECORDS:

Men: 100 metres free-style, W. Ris (U.S.A.), 57.3 secs.; 200 metres breast stroke, J. Verdeur (U.S.A.), 2 min. 39.5 secs.; 400 metres free-style, W. Smith (U.S.A.), 4 min. 41 secs.; 800 metres relay (U.S.A.), 8 min. 46 secs.

Women: 100 metres back stroke, K. M. Harup (Denmark), 1 min. 14.4 secs.; 200 metres back stroke, P. Van Vliet (Netherlands), 2 min. 57.2 secs.; 400 metres free-style, A. Curtis (U.S.A.), 5 min. 17.8 secs.; 400 metres relay (U.S.A.), 4 min. 29.2 secs.

Swinburne, ALGERNON CHARLES (1837-1909). British poet and dramatist. He was born in London, April 5, 1837, eldest child of Admiral Charles Henry Swinburne and Lady Jane, daughter of the 3rd earl of Ashburnham. In spite of his literary republicanism, Swinburne was always the complete aristocrat. He was educated at Eton, from which he was withdrawn in 1853, after a gradually developing lack of response to discipline. He entered Balliol College, Oxford, in 1856; Jowett was attracted by him and remained a valued friend; but Swinburne did not conform to Oxford traditions, and went down without a degree in 1859. An avid reader from early

childhood, he declared that Lamb's Specimens and the Bible taught him more than anything else.

The second and most important period of his life began in 1861, when he settled in London in close relation with the group of Morris and Rossetti. His first published volume contained the two plays, *The Queen Mother* and *Rosamond*, 1860. Passing over much occasional work, including *Chastelard*, the first of his Mary plays, *Bothwell* and *Mary Stuart* completing the trilogy, we come to the two volumes that placed him among the chief of British lyrical poets, *Atalanta in Calydon*, 1865, and *Poems and Ballads*, 1866.

The latter aroused much protest from conventionally respectable readers, but the youth of England took it to their hearts and chanted its measures in innumerable imitations. Later came *William Blake*, 1868, possibly his best book of prose criticism, and *Songs before Sunrise*, 1871, perhaps his best book of lyrics, some of them inspired by a meeting with Mazzini. Much may be forgiven to the man who wrote *The Eve of Revolution*. Robert Buchanan made himself notorious by a bitter and pseudonymous attack on the Swinburne-Rossetti verse, called *The Fleshly School of Poetry*, and was answered vigorously by Swinburne in *Under the Microscope*, 1872.

Principal Works

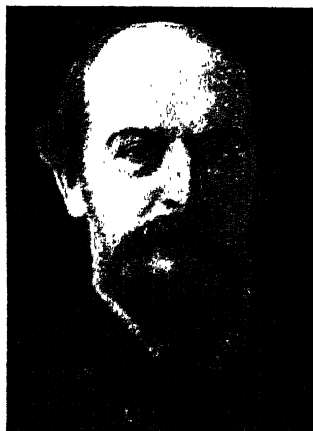
Some of Swinburne's numerous publications that must be specially mentioned are the prose study of Chapman, 1874; *Erechtheus*, 1876, a tragedy in Greek form, not one of his most popular inventions, but certainly one of his loftiest, with magnificent choral odes; *Poems and Ballads*, Second Series, 1878, which some would put first among his books; *The Heptalogia*, 1880, a remarkable collection of parodies, the victims being Tennyson, the Brownings, Patmore, Owen Meredith (Lytton), Rossetti, and himself; and *Tristram of Lyonesse*, 1882, a sort of Wagnerian music-drama, monotonous in its long drawn ecstasy, and not guiltless of some artificial emotion. Its handling of the heroic couplet is specially noteworthy.

The year 1879 marks a crisis in his life and initiates what may be called his third period. He had lived an irregular life in London, in which drink and women, among them the notorious Adah Isaacs Menken, had played a large part. His excesses brought on periodic collapses, with epileptic fits. His physical salvation was effected by

Theodore Watts (Watts-Dunton), a Huntingdonshire solicitor, who had taken charge of Swinburne's business affairs.

Watts took possession of the poet and carried him off to Putney, where he recovered and lived in almost unvaried peace, health, and happiness for another thirty years. Few men have been more devotedly cared for. He had a serious illness in 1903, but recovered. In 1909 he took a chill, and died of pneumonia on April 10. He was buried at Bonchurch, among his family. He was unmarried.

Swinburne is one of the most remarkable and original of English poets. In his odd frail



Al Swinburne
Elliott & Fry

body was housed a spirit of indomitable courage and pugnacity. Until age had toned down some of his eccentricity of appearance he seemed not so much real as a character from Poe or Hoffmann come alive; and his works are those that such a person might have written.

The music of his verse was as new to Victorian English ears as its subject matter. He wrote as Tannhäuser might have sung, with the madness of the Venusberg upon him, of strange sins, and exotic passions and mad eroticism. His measures were not new, but they sounded on his lyre as if they had never been heard before. Swinburne represents genius without talent, passion without reason. The cooler facts upon which he touched—Hugo, Mazzini, Italy, France—were all emotions felt wildly, rather than things understood clearly.

All his life he was the victim of his own words, which extended some poems and essays to intoler-

able length. That the bulk of his work will endure is improbable; but his greater lyrics will last as long as English poetry. See Michelangelo.

George Sampson

Bibliography. Collected Poems and Tragedies, 11 vols., 1904-06; Letters, ed. T. Hake and A. Compton-Rickett, 1918; *Life*, E. Gosse, 1917; *Critical Study*, E. Thomas, 1912; S., an Estimate, J. Drinkwater, 1913; S. as I Knew Him, C. Kernahan, 1919; S. at Home, C. Watts-Dunton, 1922; Swinburne, H. Nicolson, 1926; S., a Literary Biography, G. Lafourcade, 1932; Swinburne's Literary Career and Fame, C. H. Hyder, 1933; *Poems and Prose* ed. with intro. R. Church, 1940.

Swindling OR CHEATING. At common law, a misdemeanor closely allied to the offence of obtaining money or property by false pretences. The offence includes using false weights and measures or false coins or tokens, or otherwise cheating or deceiving "so as people cannot by ordinary care guard against; but not where it is a mere imposition by deception against which common prudence might detect." See *Coining*.

Swindon. Mun. borough and industrial town of Wiltshire, England. It is a rly. junction 77 m. W. of London. Old or Hye Swindon stands on a hill, alt. 480 ft., and has been a market town since the 17th century. Here are an interesting parish church (1851), town hall, and corn exchange. New Swindon grew up after the establishment in 1841 of the works of the former G.W.R., which provide the chief occupation, though there is also an agricultural trade. Buildings include churches, hospitals, library, theatre. The borough charter dates from 1900. In 1946 was opened the first municipally owned arts centre in England. Pop. approx. 68,000.



Swindon arms

Swine Fever. Name given to three separate infectious diseases which attack swine. They are (1) swine plague, a septic gastro-enteritis caused by a bacillus; (2) infectious pneumonia, caused by an ovoid bacterium; (3) the real hog cholera, caused by quite a different form of microbe from either of the former diseases. An animal infected by any one of these three diseases becomes dull, loses its appetite, and seeks a dark corner. Its eyes are affected, and later its flexor muscles. No cure is known. An outbreak

must be immediately notified and the infected animals slaughtered.

Swinemünde (Pol. Swinoujscie). Port, resort, and saline spa on the is. of Usedom, Pomerania. Founded c. 1730, granted urban rights by Frederick II in 1765, it became a Prussian customs control station and fortified port from 1925, also an airport. Steamers and motor vessels plied to neighbouring resorts. There is a fine sandy beach. Industries normally are connected with shipbuilding, fishing, and the timber trade. During the Second Great War Swinemünde was occupied by the Russians May 5, 1945, and later was in the area placed under Polish administration. Pop. 21,152.

Swing. Form of dance music. It may be regarded as a development of jazz (*q.v.*), fostered during the depression years in America, which became prominent from about 1935. The collective improvisations of jazz musicians began to be replaced by harmonisation and written arrangements (or orchestrations), and the traditional folk tunes of jazz were replaced by popular but synthetic "hits." Commercial exploitation of this form of jazz created a vast industry, which catered for millions the world over.

Confusion was created in the public mind, partly as a result of the way in which recording and broadcasting authorities include all jazz and swing under the heading swing. Younger musicians, anxious to appear up-to-date, dismissed the word jazz as old-fashioned. This in turn led the more discriminating jazz-lovers to invent new names to distinguish the original jazz, such as real, hot, true.

Various devices have been fashionable in swing music; the use of string sections; the repetitive short phrase known as a riff which soon becomes monotonous; the glorification of top notes, often unfitted for the register of the instrument concerned; and the use of instruments unsuitable for the idiom.

These, however, are the worst attributes, and many of the best swing bands play with great technical efficiency. Experiments in America and in England show the possibilities of swing in the style of modern music in a more serious vein, the influence of Shostakovich (*q.v.*) being marked. A later variation is sometimes termed Re-bop; this makes use of unusual chord structures, with the melody instruments often playing in unison, and with a great deal of trumpet exhibitionism. The

rhythm section is given a far greater latitude than that assigned to it in jazz or ordinary swing.

Rex Harris

Swing, RAYMOND GRAM (b. 1887). American journalist and broadcaster. Born at Cortland, N.Y., March 25, 1887, he was educated at Oberlin College, Ohio, and became a journalist in Cleveland, working on various Middle West newspapers. He represented the Chicago Daily News in Berlin, 1913-1917; he was London correspondent of the New York Evening Post, 1924-34; New York correspondent of the London News Chronicle, 1936-37. As a commentator on American affairs for the B.B.C., 1935-45, he became known to millions of British listeners, and during the Second Great War his weekly broadcasts from the U.S.A. were equally popular. He published, among other books, *Preview of History*, 1943; *In the Name of Sanity*, 1946.



Raymond Gram Swing, American journalist

Swinnerton, FRANK ARTHUR (b. 1884). British novelist and critic. He was born at Wood Green, London, Aug. 12, 1884, and in youth entered a publisher's office. He soon had a name for well constructed novels of English life, of which the first was *The Merry Heart*, 1909, and the best known *Nocturne*, 1917; *The Georgian House*, 1932. Concurrently he became a literary critic, publishing *Studies of Gissing*, 1912, and *Stevenson*, 1914. *The Georgian Literary Scene*, 1935, was a stimulating study of friends and contemporaries, and his autobiography in 1937 won him many new admirers. He wrote for this *Encyclopedia* the article *Novel*.



Frank Swinnerton, British novelist

Swinton. Market town and urban dist. of the W. Riding of Yorkshire, England. It lies 10 m. N.N.E. of Sheffield, being a rly. junction. Here the Don navigation joins that of the Dearne and Dove. Iron goods, pottery, and glass are manufactured, and there are coal mines. Market day, Sat. Pop. 13,820.

Swinton, PHILIP CUNLIFFE-LISTER, 1ST VISCOUNT (b. 1884). British politician. He was born May 1, 1884, at Ayton, Yorks, the youngest son of Y. G. Lloyd-Greame, changing his name to Cunliffe-Lister in 1924 when his wife inherited property. He went to Winchester and University College, Oxford, and was called to the bar, 1908. Conservative M.P. for Hendon in 1918, he became parl. secretary to the board of trade two years later, and received a knighthood. From Oct., 1922, to Jan., 1924, Sir Philip was president of the board of trade, and again from Nov., 1924, until 1929. During 1931-35 he was colonial secretary, being raised to the peerage in 1935, and moving to the air ministry until 1938. He was resident minister in W. Africa 1942-44, then minister for Civil Aviation until 1945.



Viscount Swinton, British politician

Swinton, SIR ERNEST DUNLOP (b. 1868). British soldier and writer. He was born Oct. 21, 1868, and educated at Rugby and Cheltenham. In 1888 he entered the army, and won the D.S.O. during the S. African War, 1899-1902. The official "Eye-Witness" of the First Great War, he helped to invent, and commanded the first unit of, tanks. Major-gen. in 1919, he was knighted in 1923. Meanwhile he had made a name as a writer under the pseudonym, Ole-Luk-Oie (taken from Hans Andersen), his best-known work being *The Green Curve*, 1909. Under his own name he wrote books on military history, including *The Study of War*, 1926, and from 1925 to 1939 was Chichele professor of military history at Oxford. During the Second Great War his war commentaries on the B.B.C. attracted wide attention.



Sir Ernest Swinton, British soldier

Swinton and Pendlebury. Mun. bor. of Lancs, England. It is situated 5 m. N.W. of Manchester, with which it has rly. and bus connexion. It has many industries, including coal mining, cotton spinning, engineering, and

the manufacture of electric batteries. S. Peter's church here was designed by Sir Gilbert Scott. Pop. 40,750.

Swiss Cottage. Locality in N.W. London. The name is derived from that of a tavern supposed to be built in the style of a Swiss chalet. A station on the Bakerloo tube rly. is at the junction of Finchley Road with Belsize Road, College Crescent, Avenue Road, and Eton Avenue. Close by are a Congregational training centre, New College; and the Embassy Theatre (*q.v.*).

Swiss Family Robinson. THE. Story recording the adventures of a family wrecked on an uninhabited island; suggested by Defoe's Robinson Crusoe. It was written by a Swiss pastor, J. D. Wyss (1781-1830), and published in 1813.

Swiss Guards. Former regiment of bodyguards to the French throne. Recruited in Switzerland,

the regiment was first raised in 1616. In the Revolution the loyalty of the Swiss Guards made them unpopular and after bravely resisting the mob which invaded the Tuileries, Aug. 10, 1792, they were disarmed and massacred. The Lion of Lucerne (*q.v.*) commemorates their gallantry, as does a famous passage in Carlyle.

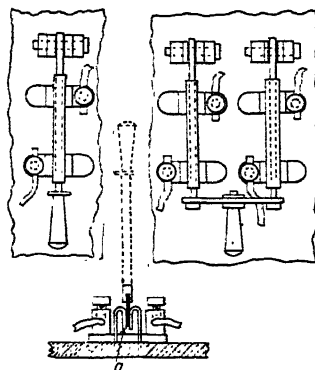


Swiss Guards.
Private in the
Papal Guard

Another body of troops called the Swiss Guard, or Papal Guard, is employed by the pope at the Vatican palace. It consists of about 120 officers and men of Swiss nationality. They mount guard at the Vatican, take part in processions and form guards of honour for the pontiff. Their red and yellow uniform is said to have been designed by Michelangelo.

Switch. In electricity, a device for opening and closing a circuit by means of metallic contacts which can be pressed together or separated easily and safely, or for changing the connexions of a circuit or a number of circuits with ease and rapidity. A single-pole switch acts on one conductor only,

and double-pole switches are often used. For three-phase A.C. work, triple-pole switches are used, making and breaking all three conductors simultaneously. A double-throw or changeover switch changes over from one circuit to another. The simplest form of switch is the knife or lever pattern, which consists of a copper blade hinged at one end, and with a handle at the other, by which it is forced into, or removed from, springy copper clip contacts, the whole being mounted on an insulating base. (*See illustration.*)



Switch. Top, single- and double-pole types shown in plan; below, cross-section showing contact made by switch bar at *a*; when handle is raised, as in dotted lines, the switch bar is lifted up and contact is broken

This type, having live metal exposed, is suitable only for use on switchboards which are not accessible to unauthorised persons. Similar patterns are in common use which have the entire switch enclosed in a metal case, and operated by an external handle; they are known as ironclad switches. Smaller varieties are often made with an enclosure of plastic material. Possibly the most commonly met with type is the tumbler switch used on ordinary lighting circuits, where the contacts are enclosed under a cover, through which the handle or dolly projects.

For many years it was thought that the most certain way of breaking a circuit was by the use of a quick-break arrangement, whereby the handle, instead of operating the contacts directly, loads a spring which, in turn, opens the switch, thus rendering it impossible to open the contacts slowly, which often caused destructive arcing. This is still so on D.C., but on A.C. considerable success has been achieved with a micro-break switch, in which the

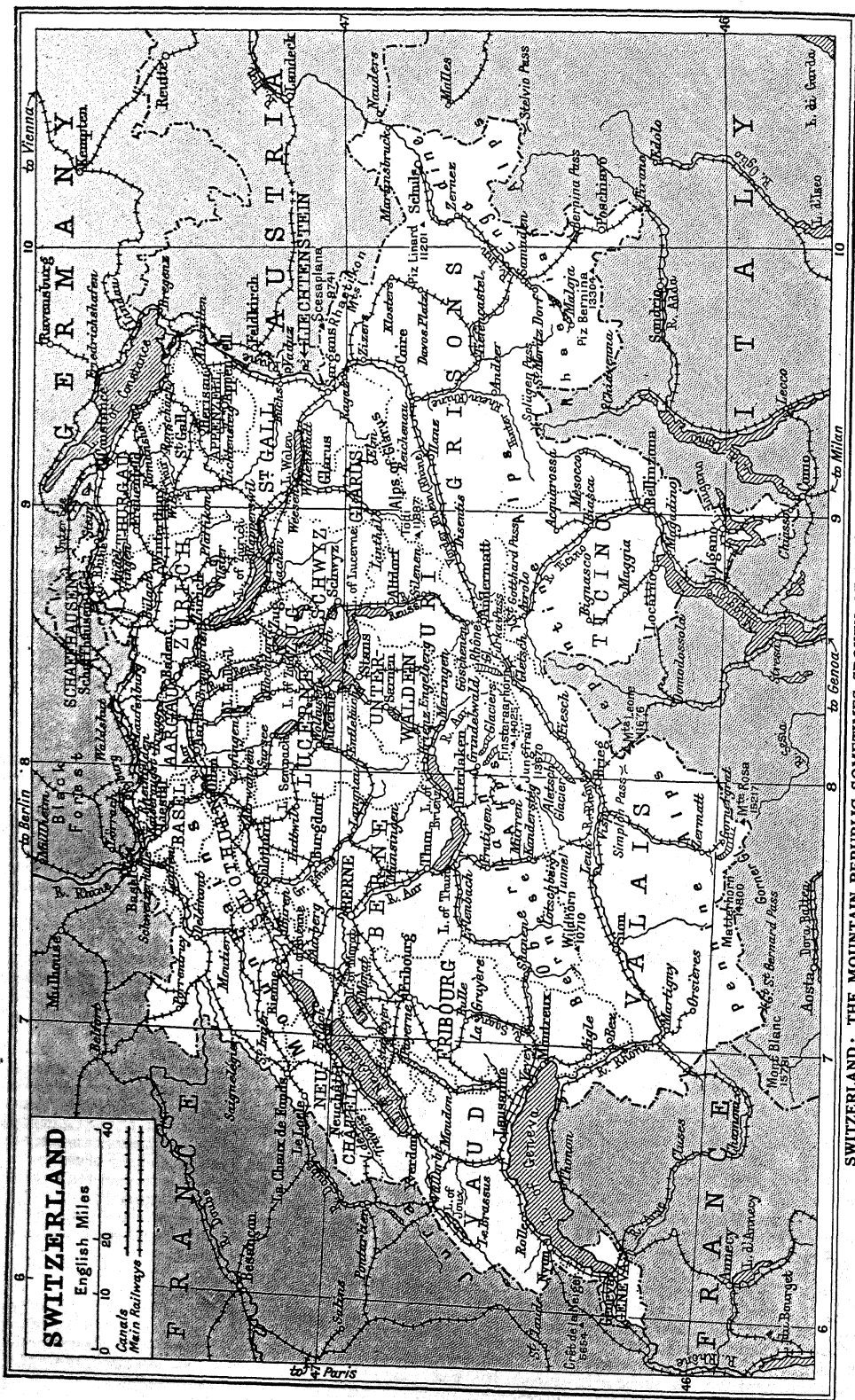
contacts are separated by only a few thousandths of an inch, and several patterns of tumbler switch are now made on those lines.

Switching is a term used in engineering to cover items ranging from the very smallest tumbler switch to the largest oil circuit breakers (*see* Circuit Breaker). In addition to opening and closing circuits, a wide variety of other switches are used. The dial switch, which has a contact arm pivoted like a clock hand, moving round over a circular array of contact studs, is used for circuit changing, or for regulating work cutting in and out amounts of resistance, etc.

Switchback. Term used in rly. engineering to denote a certain arrangement of track whereby a steep mountain-side can be ascended or descended. The track takes a zigzag course, and at each angle there is room for the train to pass beyond the switch, by which it is deflected on to the next arm of the zigzag. Unless provision is made at the turns for enabling the locomotive to transfer itself to the other end of the train, it will alternately push and pull the train. The term is also applied to an undulating rly. sometimes built amid imitation scenery, and generally used for amusement purposes. *See* Railway.

Switchboard. Support of non-conducting, incombustible material, on which are mounted the switches, fuses, indicating instruments, and other apparatus for controlling the generation and distribution of electric current. In a small private installation all the items are usually grouped on one slab; in a generating station or distributing station the switchboard may be sub-divided into a number of panels, each carrying the instruments of one generating or one distributing circuit. *See* Circuit; Lighting, Electric.

Swithin OR SWITHUN (d. 862). English saint and bishop. According to tradition, he was of noble birth and became a priest at Winchester. In 852 Ethelwulf made him bishop of Winchester, where he was famed as a builder of churches. He died at Winchester, and to him the cathedral was dedicated. The popular superstition about rain on S. Swithin's Day (July 15) meaning rain for the forty days following is said to have originated in the fact that the removal of his body to the cathedral in 971 was delayed by heavy rain, but it is most likely an older belief which, by some accident, became associated with the saint. *See* Winchester.



SWITZERLAND: THE MOUNTAIN REPUBLIC SOMETIMES SPOKEN OF AS "THE PLAYGROUND OF EUROPE"

SWITZERLAND: LAND & PEOPLE

* Arnold Latt, Ph.D., Swiss writer and translator

See the articles on the cantons, lakes, rivers, towns, e.g. Geneva; Zürich, etc., of Switzerland, and those on Alps; Bobsleigh; Mountaineering; Ski-ing; Tell, William, etc. See also Europe; Federalism; Sonderbund, etc.

Switzerland is a Federal State of Europe. One of the few entirely inland countries of Europe, it lies between France and Austria and between Italy and Germany, being a buffer state between the four countries. It comprises three bands of country, which curve slightly from S.W. to N.E.; the first, along the French frontier, consists of comparatively minor heights of the limestone Jura Mts.; the second the trough, a fairly level plain between the mts., with the Lake of Geneva in the S.W. and the Lake of Constance in the N.E., the whole gently sloping down towards the Juras, to the lowest level which is close to the inner edge of these mountains along the line of the Lakes of Neuchâtel and Bienne and the lower Aar; the third an extensive central section of the Western Alps. In the N., i.e. in the neighbourhood of Basel, and in the S., in the valley of the Ticino, occur two relatively small areas which do not belong to any of the three bands.

Switzerland arms



The St. Gotthard district is the commanding portion of the Alpine band. S.E., Canton Ticino slopes S. and drains to Lake Maggiore and Italy. S.W., Canton Valais is the upper Rhône valley between Bernese Oberland and the Pennine Alps. E., Canton Grisons comprises the head valleys of the Rhine between the Alps of Glarus and the Rhaetian Alps, and the Engadine, the valley of the upper Inn within the Rhaetian Alps. N., Canton Uri is the valley of the upper Reuss.

These four cantons are in every way Alpine. Fribourg, S.E. of the Lake of Neuchâtel, Lucerne, Zug, Aargau, Zürich, Thurgau, and Schaffhausen are the cantons of the trough; in all drainage is to the Rhine either directly or through the Aar. Unterwalden, Schwyz, Glarus, St. Gall, and Appenzell belong to the Alpine slopes drain-

ing to the trough. Neuchâtel entirely and Solothurn mainly are cantons of the Jura Mts. Basel belongs to the Rhine valley in the gap between the Jura Mts. and the Black Forest. Geneva similarly belongs to the Rhône valley. Vaud in the S.W. has both Jura and Alpine slopes connected by the end of the trough which slopes away from the Aar to the Lake of Geneva. Berne, the capital canton, alone partakes of the composite character of the country; it extends from the valley of the Doubs, across the Juras, across the trough locally called Lakeland and Middleland, up the Alpine slopes to the crest of the Bernese Oberland, and in the extreme E. to the St. Gotthard dist.

In so far as the spoken language is a test of nationality, Switzerland is mainly and historically German, for 19 cantons are German-speaking, 5 are French-speaking, and Ticino is Italian in speech. Except French Fribourg, the federation was solidly German until 1803, when Vaud (French-speaking) joined; the 1815 additions were all French.

The main rivers, Rhône, Aar, Reuss, Rhine, Inn, and Ticino, radiate from the St. Gotthard centre; numerous tributaries of the Aar and Rhine flow almost N.W. across the trough.

The Large Lakes

The large lakes belong to the trough; Geneva and Constance are at the ends, Neuchâtel and Bienne on one edge, and Thun, Brienz, Lucerne, Zug, Zürich, and Walen where the valleys abut on the plateau. Only small portions of Maggiore and Lugano are Swiss.

The climate varies greatly. The St. Gotthard has an annual rainfall of about 90 ins., while Andermatt, less than 2,000 ft. below, has only half that amount. Geneva, Ticino, and Vaud, with a southerly aspect, are more genial than St. Gall or Schwyz. The snow line varies between 8,500 and 9,500 ft., though the S. wind, warmed by the Föhn effect, removes the snow with great rapidity from favoured valleys. Olives thrive in the warmest valleys, vines, deciduous trees, and cereals, coniferous trees, summer pastures, or true Alps, and mosses follow in sequence up the mountain sides. Cultivation is rarely attempted above 3,500 ft.; 22 p.c.

of the country is forest; 25 p.c. pasture, and 25 p.c. arable.

There are 300,000 peasant proprietors, representing about half the population. Rye, wheat, oats, and potatoes are the principal crops, and considerable attention is paid to fruit-growing. Home-grown food supplies are inadequate to the needs of the population, and wheat, potatoes, and vegetables are imported in considerable quantities. Spirits, such as the cherry brandy of Basel, are made from the fruit, and wine from the grapes grown in the warmer S. The pastoral industry is of considerable importance, for thereby use is made of the rich summer pastures almost to the snow line. Condensed milk and cheese are valuable exports. Beef cattle are imported.

Resources and Industries

Switzerland has few minerals. Asphalt is obtained in the Val de Travers in the Jura. Salt is mined at Bex (Vaud), Schweizerhalle (Basel), Rheinfelden, Ryburg, and Kaiseraugst (Aargau). Small quantities of iron ore are obtained in the Juras, and of coal in Valais, while large quantities are imported, the coal chiefly from the Saar Basin. Manufactures are, despite these drawbacks, of considerable importance; they depend upon large supplies of water power (white coal) and upon domestic industries. Cottons are made on the N.E. German cantons, lace and embroidery in St. Gall, and Appenzell, silk goods in Basel and Zürich, watches in the French towns Geneva, La Chaux de Fonds, and Le Locle. Gruyère cheese and Vevey condensed or Swiss milk and chocolate are known almost all over the world. Aluminium is manufactured in Schaffhausen and Chippis, and aniline dyes in Basel.

The rivers, except the Rhine up to Basel, are not navigable, the lake steamers are mainly devoted to the tourist traffic; imports and exports, the local transport of merchandise, and the tourist traffic require a highly developed railway system, which must obviate the difficulties of the Alpine heights. The main rly. routes are two, both of which are double. In the N. from Basel the first goes via Zürich to Vienna and via Lucerne and the St. Gotthard tunnel to Milan. In the S. the second from the Simplon Tunnel goes via Martigny and Lausanne to Paris and via the Lötschberg tunnel to Berne, Bienne, and London. The N. route connects with the Rhine valley and Berlin from Basel; the S. route connects with Milan and Genoa.



Switzerland flag. Red with white cross

The chief cross connexion follows the line of the trough from Lausanne through Berne or Bienne to Olten, Zürich, Winterthur, and St. Gall. Minor connexions cross the trough to the tourist centres. All the main lines are electrified.

Constitution and Government

The Swiss constitution is definitely democratic. The president and vice-president of the federal council are elected annually for one year by the federal assembly. The federal council consists of seven salaried members, each of whom is the chief of a state department; it is elected for four years by the federal assembly. The legislative authority is exercised by a parliament of two houses, a council of states and a national council. The former consists of 44 members, two from each canton. The cantons elect them in the way they think best, not on a uniform plan.

The national council comprises 198 members, elected by the whole population on a ratio of one deputy for 22,000 people; on this basis Berne sends 33 deputies, Zürich 31, St. Gall 13, Vaud 16, and the others similarly in proportion to their population. The general election of deputies is quadrennial and by ballot, and the franchise is enjoyed by all adult male citizens. Legislation may be initiated or vetoed by the popular voice; the referendum, which demands a majority of votes by cantons, is invoked by a petition presented by 30,000 citizens or a demand by eight cantons.

The central govt. (federal council and federal assembly) is supreme in international relations, rlys., posts, telegraphs, higher education, and public works of general importance. In other matters each canton or half canton is sovereign. In the smallest cantons these matters are settled by the male adult citizens assembled in the open air; these are the *landsgemeinden*. In the larger cantons a great council, chosen by universal suffrage, controls local government.

Except in the smallest cantons and in the canton of Fribourg, the referendum is applied to local affairs. In Zürich nearly every matter of importance is determined by the referendum. In some cantons a referendum also initiates legislation. Pop. 4,265,703.

HISTORY. In the 13th century the Alpine area which we now call Switzerland lay within the bounds of the Holy Roman Empire. Its population did not form a state, but was divided into a large number of communities, fractions of

the imperial system, of varying races and languages. The beginnings of union were made by the three forest cantons of Schwyz, Uri, and Unterwalden, round about the lake of Lucerne; the historic beginning being the Everlasting League formed between them in 1291, immediately after the death of Rudolph I.

Rudolph of Hapsburg had various claims to lordship in these districts, but the imperial rights were not an appanage of the house of Hapsburg; therefore on his death the people of these three cantons formed a league to maintain their rights, "each for all and all for each," without prejudice to the duty of any community to its own overlord. The saga of William Tell belongs to the days of Rudolph's son Albert, and is not entirely without historical foundation. In 1315 Leopold of Hapsburg endeavoured to assert the family rights over the forest cantons and other communities, but his mail-clad forces were put utterly to rout by the mountaineers at the battle of Morgarten on Nov. 15, which for the time being secured the independence of the forest cantons.

Additions to the League

On Dec. 7, 1332, the fourth forest canton, Lucerne, was added to the League. The free city of Zürich was admitted in 1351; Glarus and Zug followed in 1352, and in 1353 the great city of Berne joined the confederation. Each governed itself after its own fashion, five being pure democracies, one a pure oligarchy, while the other two were mixtures. The character of their alliance was rather indefinite; all were not even formally allied with all; but the general principle bound all to support each in the maintenance of its rights. The urgent cause of alliance was still the Hapsburg menace, most of the states having come in to obtain help in resisting Hapsburg claims. A second Leopold of Hapsburg marched against the confederates, but was killed at the battle of Sempach, July 9, 1386. After the victory at Näfels in 1388 all the claims of the Hapsburgs were formally resigned under the treaty of 1389.

The adhesion of Berne paved the way for the absorption of French-speaking districts into what had hitherto been a confederation of purely German communities. The next great struggle was that with Charles the Bold of Burgundy, in which the Swiss must be regarded as the aggressors, though the ambitions of the duke of Burgundy

almost warranted the argument that to attack was no more than a necessary mode of defence. Again the Swiss displayed their magnificent fighting qualities by defeating Charles at Grandson, March 3, 1476, Morat, June 22, 1476, and Nancy, Jan. 5, 1477, when he was killed. The overthrow of Burgundy secured the Swiss against their last dangerous enemy, but very nearly brought about a dissolution of the Confederacy through internal discords. The danger was averted, however, by the pact of 1481, which was followed by the admission of more cantons and districts into the league. Actually, though not formally, the Confederacy became independent of imperial control in 1499, and in 1513 the confederation of thirteen cantons—the Switzerland of today—was completed.

Swiss Soldiers as Mercenaries

The Burgundian war had established the reputation of the Swiss as soldiers, and the Confederacy sold the services of its troops, to its own advantage, in the confused wars of the early 16th century. Switzerland played a leading part in the Reformation owing to its independence of external control, which allowed its members to follow their own lines. The Zürich school was founded by Zwingli, a dominant figure in the third decade of the century, and in the fifth decade John Calvin reigned supreme at Geneva, the nursery of the sternest and most uncompromising of the creeds which are called Protestant. In the nature of things it inevitably followed from the individual independence of the separate communities in the Confederation that compromise should be forced upon them as a body, each state controlling religion within its own area. In this sense at least, Switzerland was the home of toleration. Almost secured against external attack by the nature of the country, she was enabled to develop on her own lines, practically unperturbed by the wars which shook Europe; and in 1648, in the peace treaty of Westphalia, the Swiss Confederacy was finally recognized as an independent state.

For the next century and a half Switzerland, though she stood apart from the main current of the European struggles, was greatly influenced by France. Her history was replete with internal quarrels. The French Revolution was in part the product of the political gospel of Jean Jacques Rousseau, himself a Swiss born in Geneva. Switzerland was naturally greatly

affected by it, and the country was filled with revolutionary movements. In 1798 France intervened, and in spite of determined but isolated efforts at resistance, created what was named the Helvetic Republic, with a central government which was practically at the orders of the French Republic.

In 1803 Napoleon took matters in hand, and reorganized the constitution. On his fall the Congress of Vienna in 1815 restored to the nineteen cantons of the Act of Mediation districts which had been annexed by France, raising the number to twenty-two, and the Napoleonic system was dissolved. At the same time the Congress guaranteed permanently the neutrality of Switzerland and the inviolability of her territories. The autonomy of the several cantons was restored, and the central government exercised control only in foreign affairs and matters which were of common interest. The instrument establishing the constitution is known as the Federal Pact of 1815.

The democratic movement, which had received its impulse from the French revolution, was checked by the reactionary settlement of 1815, but one after another the several constitutions of the cantons acquired a more democratic character. Religious quarrels, however, led to the formation in 1843 of the *Sonderbund*, a league of the Catholic cantons, which was suppressed in 1847; the intervention of the Powers in its support was dexterously prevented by Lord Palmerston, enabling Switzerland to settle her own affairs for herself. In 1848 the Federal Pact was revised, and a new constitution was created, under which the central government (federal council) acquired further powers conceded to it by the several cantons. A federal government had at last been established, not under foreign pressure but by the Swiss themselves. Further modifications were made in 1874.

Switzerland's policy during both Great Wars was dictated by her permanent neutrality, which did not prevent her from becoming a member of the League of Nations, the international court of justice, and of Unesco, though not of the United Nations.

LANGUAGE AND LITERATURE. Four languages are spoken in Switzerland—German by about 68 p.c., French by 23 p.c., Italian by 7 p.c., and Romansch by 1 p.c. French is the language of N.W. Berne, Neuchâtel, W. Fribourg,

Vaud, Geneva, and Valais W. of Leuk; Italian of Ticino and part of Grisons; Romansch, a language of Latin origin, is spoken in parts of Grisons, and includes the Ladin dialect in the Engadine; German is the language of the rest of the country. German, French, and Italian are the official languages.

German-Swiss literature begins in the late Middle Ages with war-songs and chronicles, followed in the 16th century by the works, in Latin as well as German, of a group of scholars and humanists, of whom the philologist and naturalist Conrad Gesner (1516–65), and the historians of Switzerland, Aegidius Tschudi (1505–72) and Stumpf (1500–76), were among the

The first French Protestant Bible was published at Neuchâtel in 1535. Later writers, when not theologians, were chiefly devoted to the sciences, and to Swiss history and topography. A French refugee, Louis Bourguet (1678–1743), founded *Le Mercure Suisse* in 1732, its literary section, *Le Journal Helvétique*, appearing six years later. Philosophy is represented by J. P. de Crousaz (1663–1750) and Charles Secrétan (1815–95). Eméric de Vattel of Neuchâtel wrote an important work, *The Law of Nations*, in 1758. H. B. de Saussure (1740–99) is a classic in the literature of the Alps, and Philippe C. Bridel (1757–1845) won fame by his descriptions



Switzerland. Peasants in gala costume. Left, cowherds carrying decorated collars and bells to adorn their animals. Right, a bridal couple

chief, while the Reformation produced the satiric Bernese poet Nicholas Manuel (1480–1530). After long decay, letters revived in 1721 at Zürich with J. J. Bodmer and J. J. Breitinger, critics who championed "nature" under the banner of Shakespeare and Milton against French classicism, and powerfully influenced German literature. Albert von Haller (1708–77) was distinguished in poetry as in science. At Basel Isaac Iselin (1728–83) was a prominent philosopher, and Leonhard Euler and the Bernoullis were great mathematicians. In the 19th cent. J. H. Pestalozzi won world fame as an educational reformer, and in fiction Albrecht Bitzius (1797–1854), known as Jeremias Gotthelf, and Gottfried Keller were subtle delineators of Swiss peasant life, while C. F. Meyer, who was both novelist and poet, chose past ages as the setting for his artistic studies of character.

Of French-Swiss literature there is little before the Reformation, of which the W. Cantons were a stronghold and place of refuge.

of Swiss scenery and life in verse and prose. J. H. Merle d'Aubigné (1794–1872) is the historian of the Reformation.

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Swivel (O.E. *swifan*, to move, turn). Coupling device which permits one portion of itself to rotate about an axis. The word is also used for something which turns about a pivot, e.g. a swivel gun. A loop through which passes a check rein, and the shuttle of a ribbon loom are also called swivels.

Swiveller, RICHARD. Character in Dickens's *The Old Curiosity Shop*, usually remembered as Dick Swiveller. He is an impecunious, irresponsible, sociably disposed young man, possessing a flow of grandiloquence eked out with quotations from popular ballads. As a clerk in the service of Sampson Brass, he befriends and eventually marries the Marchioness (*q.v.*).

Sword. Weapon of offence in fighting. The history of the sword goes so far back, and is so intricate, that it is impossible to do more than mention the

principal types of weapons in use at different periods. The early sword, as used by Asiatic, Greek, and Roman soldiery, was short, often leaf-shaped and pointed. It was more used as a cutting than as a stabbing weapon.

The swords of the 8th and 9th centuries were longer, and at the time of the Norman Conquest assumed a very ill-balanced form with long, wide blade, short pommel, and cross hilt. This weapon was used only for cutting, and was of no use for thrusting. By the 15th century a new type had evolved with blade tapering to a fine point, adapted rather for thrusting, than cutting, and a long grip. From this type branched off the two-hand sword, often 5 ft. long, which was purely a cutting weapon needing a wide swinging space for its use.

With the 16th century we find sword play developing. With it the hilt of the sword changes, and in place of the simple cross hilt we have a series of guards and counter guards, which are to be seen on rapiers and small swords up to the end of the 17th century. The use of these guards was primarily to protect the hand and do away with the need for the gauntlet of steel, but they also served to entangle the adversary's blade. The rapier and its associated type were mainly thrusting swords, but side by side with these weapons the broad sword, hanger, and cutlass also developed with complex

guards of somewhat similar design. At the end of the 17th century we find usually only one cutting edge, and after this date the blade is usually curved. *See* Africa; Anglo-Saxon Antiquities; Armour; Broadsword; Claymore; Fencing; Joan of Arc illus.; Regalia; Sabre; Scabbard; Scimitar.

Sword Bean (*Canavalia ensiformis*). Climbing herb of the family Leguminosae, native of India, Africa, and tropical America. Its leaves are divided into three large oval leaflets, and the purple, pea-like flowers are borne in long sprays. They are succeeded by scimitar-shaped pods a foot long, containing a number of beans.

Sword Dance.

Dance in which use is made of a sword or swords. Such dances are known in many parts of the world. In the Scottish version, two swords are laid crosswise on the ground, the dancer performing his steps between the blades without touching them. *See* Dancing; Morris Dance.

Swordfish.

Torpedo-reconnaissance aeroplane produced for the Royal Navy by the

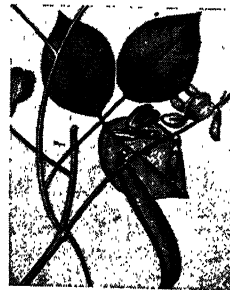
Fairey Aviation co. The Swordfish, one of the last biplanes to enter squadron service, first flew in 1934. It was the only operational biplane to serve throughout the Second Great War, and proved extremely versatile. It was designed to carry externally one 18-in. torpedo or up to 1,500 lb.

of bombs as main armament; later, rocket projectiles were often added. The engine was the 750-h.p. Bristol Pegasus, and the maximum speed 138 m.p.h. The wheels were interchangeable with twin floats.

Sword-fish

(*Xiphiidae*). Fam-

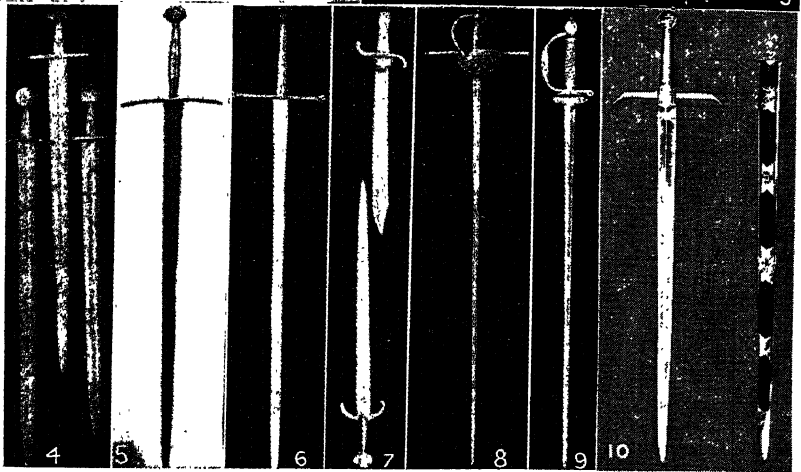
ily of fishes. It is distinguished by having the upper jaw greatly prolonged to form a sword-like weapon. The fishes range in length from 4 to 15 ft., and the sword is sometimes more than 3 ft. long. The common sword-fish (*Xiphus gladius*) is found on both shores of the Atlantic Ocean. It feeds largely on



Sword Bean. Leaves, flowers, and pods



Sword-fish. *Xiphus gladius*, showing the strong, sword-like elongation of the upper jaw



Sword. 1. Ancient Greek. 2. Roman legionary sword, A.D. 17. 3. English, c. 1380. 4. Left to right, English, c. 1300; German, c. 1200; Scandinavian, c. 900. 5. State sword of Edward V. 6. German, late 15th century. 7. Two Italian swords, 16th cent. 8. Spanish rapier, 1650. 9. French, 1780. 10. Sword of honour presented by the City of London to Gen. Dwight D. Eisenhower to mark the conferring upon him of the freedom of the city, 1945
1, 2, and 5, British Museum; 3, 4, 6-9 Wallace Collection

cod, but pugnacity leads it to attack larger fish and even whales.

Swords. Northern suburb of Dublin, Eire. About 8 m. from the city, it is reached by rly. and bus, and contains Dublin airport. There are remains of an abbey and a castle, while a round tower still stands. See Round Tower illus.

Sybaris. Greek town in Calabria, S. Italy, on the W. side of the Gulf of Tarentum. Founded about 720 B.C. by Achaeans and Troezenians, it became a great and wealthy trading town, whose inhabitants were so notorious for their love of luxury and soft living that the term Sybarite became synonymous with voluptuary. In a war with the neighbouring city of Croton, 501 B.C., Sybaris was completely destroyed.

Sybel, HEINRICH VON (1817-95). German historian. Born at Düsseldorf, Dec. 2, 1817, and educated there and at Berlin university, he settled as a teacher at Bonn in 1841. In 1846 he was made professor of history at Marburg; in 1856 at Munich; and in 1861 at Bonn. In 1875 he became director of the Prussian archives. Sybel was a politician, of liberal views, tempered by a desire to see Prussia at the head of a united Germany. When at Marburg he was a member of the diet of Hesse, and when at Bonn he sat in the Prussian assembly as a National Liberal. He died at Marburg, Aug. 1, 1895.

As an historian Sybel was perhaps the ablest pupil of Ranke. His work shows the influence of the master's methods, but unlike Ranke he willingly allowed his historical knowledge to aid current political theories. He began his writings with *The History of the First Crusade*, 1841. Of his longer *History of the Revolutionary Age, 1789-1800*, he issued a revised edition in 1882. For his greatest work, *The Founding of the German Empire by William I* (Eng. trans. 1891), he had access to all the state documents.

Sybil, OR THE TWO NATIONS. Novel by Benjamin Disraeli, published in 1845. It is a political romance, marred by extravagance and unreality, purporting to show the condition of the people during the period of the Chartist.

Sycamore (*Acer pseudoplatanus*). Tree of the family Aceraceae. A native of Europe and W. Asia, it was introduced into England about 1551. It is a hardy, quick-growing tree, which reaches its full growth of 60 to 80 ft. in about 50 years, though it lives for some 200. Its leaves

are five-lobed and irregularly toothed, the flowers yellow-green, growing in long pendulous racemes. The winged fruit, or samaras, enable it to propagate freely. Its sap contains one part in eleven of sugar. The firm, fine-grained timber is used in the making of furniture, dairy utensils, mangle rollers, etc. The sycamore is also sometimes known as the great maple or false plane.

Sycophant (Gr. *sykophantēs*). In ancient Athens, one who laid false accusations before the courts, in the hope of reward. The class was frequently denounced by the comic poets. The word literally means one who shows figs, but its application is uncertain. In modern use the term means a flatterer or toady, probably because ancient sycophants endeavoured to ingratiate themselves with others by base means. Pron. sikko-fant.

Sycorax. Witch referred to in Shakespeare's *The Tempest*. The mother of Caliban, she had been banished from Argier (Algiers) to the island scene of the play. Prospero released Ariel, her one-time servant, from the tree in which she had imprisoned him.

Sycosis OR BARBER'S ITCH (Gr. fig-like ulcer). Inflammation of the hair follicles around the beard and moustache. It is due to infection by pus-producing organisms.

Sydenham. Residential suburb of S.E. London. It is in the met. bor. of Lewisham, on the Kent border, and well connected with London by four rly. stations and by bus. The name of Wells Park Road, Upper Sydenham, recalls a medicinal spring discovered in 1640, the site of which is marked by S. Philip's church. Other churches are S. Bartholomew's and All Saints'. The E. of the dist. is known as Lower Sydenham. The Crystal Palace stood at the S. end of Sydenham Hill. Admiral Bligh, Sir George Grove, Shackleton, and J. L. Baird lived in the district. Pop. approx. 30,000.

Sydenham, CHARLES EDWARD POULETT THOMSON, BARON (1799-1841). British statesman. Born



Lord Sydenham,
British statesman

at Wimbledon, Sept. 13, 1799, he spent some years in his father's counting-house, and made several visits to Russia. In 1826 he entered parliament for Dover and be-

came vice-president of the board of trade in 1830. M.P. for Manchester in the Reform parliament of 1832, two years later he became president of the board of trade, where he carried through many useful measures. In 1839 he was appointed governor-general of Canada, and was largely instrumental in effecting the union of the provinces as a sequel to the Durham report, and introduced a central government and constitution. Thomson was raised to the peerage in 1840, but after a riding accident he died Sept. 19, 1841.

Sydenham, THOMAS (1624-89). English physician. Born Sept. 10, 1624, at Wynford Eagle, Dorset,

he went to Magdalen Hall, Oxford, but his university career was interrupted by the outbreak of the Civil War, in which Sydenham served on the side of the Parliamentarians. In 1647 he entered Wadham College and studied medicine there and in France. About 1656 he began to practise in London, and in 1676 published his *Observationes Medicae* which brought him a European reputation. *Tractatus de Podagra* (Treatise on Gout) appeared in 1683. He died Dec. 29, 1689. One of the great independent medical thinkers of his time, Sydenham carried out a series of observations on epidemic diseases and introduced new treatments of small-pox and fevers.

Sydney. Name of Australian cruisers. Completed in 1912 and commissioned by the Royal Australian Navy in 1913, the first H.M.A.S. Sydney displaced 5,400 tons, had a speed of 25.7 knots, and a main armament of eight 6-in. guns. On Nov. 9, 1914, she surprised and destroyed the German commerce raiding cruiser *Emden* (g.v.) at Cocos Keeling Island. This was the first action ever fought by an Australian warship. Later attached to Beatty's cruiser squadron in the North Sea, she was scrapped in 1927.

In 1936 the Australian govt. took over from the R.N. the light cruiser *Phaeton*, renaming her Sydney. Displacing 6,830 tons on a length of 530 ft. and a beam of 56 ft., she was powered by geared turbines developing 72,000 s.h.p. to give a maximum speed of 32.5 knots. Her armament was eight 6-in., eight 4-in., and



Thomas Sydenham,
English physician

a number of smaller guns. She carried a complement of 550. This second H.M.A.S. Sydney joined the British fleet in the Mediterranean in June, 1940, and on July 19 following, destroyed the Italian cruiser Bartolomeo Colleoni (*q.v.*) in a running fight N.W. of Crete. The Italian ship was more heavily armed and, five knots faster than the Sydney, was then the fastest cruiser in the world. In Sept., 1940, the Sydney formed part of a squadron that bombarded the Dodecanese. On Nov. 19, 1941, she engaged and sank the German raider Kormoran off the N.W. coast of Australia, but was herself torpedoed and lost with all hands. In 1944 the Australian govt. authorised construction of a cruiser to be completed in 1949 and named Sydney.

Sydney. City and port of Cape Breton Island, Nova Scotia, Canada. Its importance is due to its fine harbour, and adjacent coal mines. Situated 276 m. by rly. N.E. of Halifax, it is a terminus of the E. div. of the C.N.R., also of the Sydney and Louisburg rly. The chief industries are connected with coal mining, the iron and steel trades, fishing, and boat building. Coal is exported. It was founded in 1784 to become the capital of the colony, then separated from Nova Scotia, and so it remained until the two were united in 1820. Pop. 28,305.

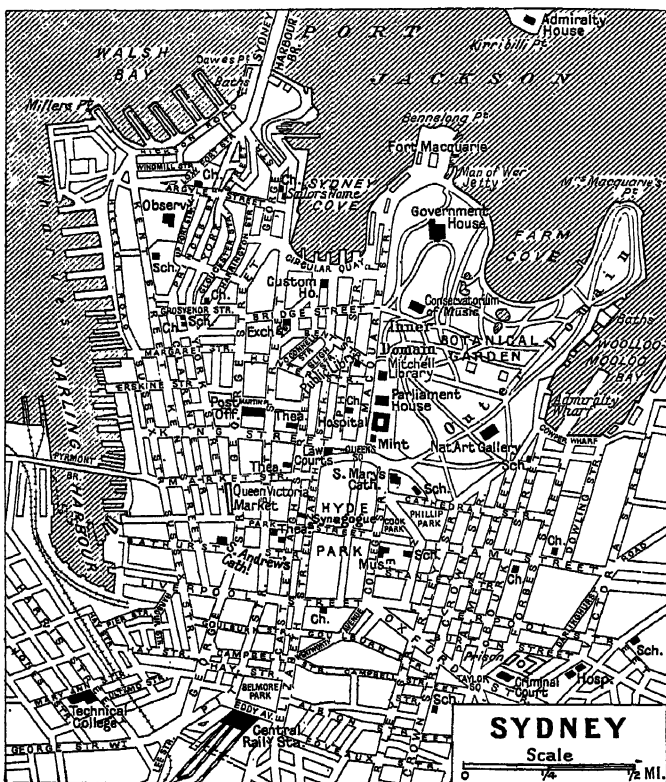
Sydney. Capital of New South Wales, Australia. The principal port and chief fortified naval station of the Australian Commonwealth, commercial and shipping centre for the S. Pacific, and important international airport, it extends 4 m. N. and S. by 3 m. E.



Sydney arms

and W. on the picturesque shores of Port Jackson, one of the finest natural harbours in the world. The mother city of the island continent, it was founded Jan. 26, 1788, by Captain A. Phillip, six days after he had landed at Botany Bay, and was named after Thomas Townshend, 1st Viscount Sydney (1733-1800), who suggested the colonisation of New South Wales, and was colonial secretary when the territory became a British possession. Pop. (1947) 1,484,434.

The site of the old town, 5 m. from the harbour entrance, at the head of Sydney Cove, was chosen because it was near a limpid stream of water, long since covered in, and then or soon after called the Tank



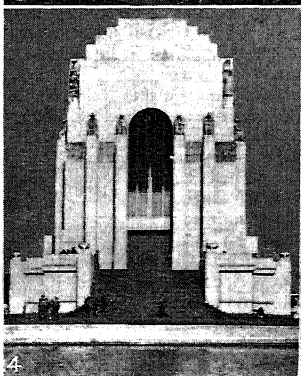
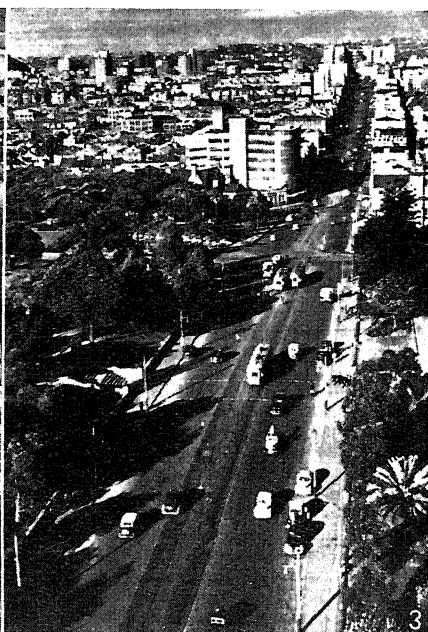
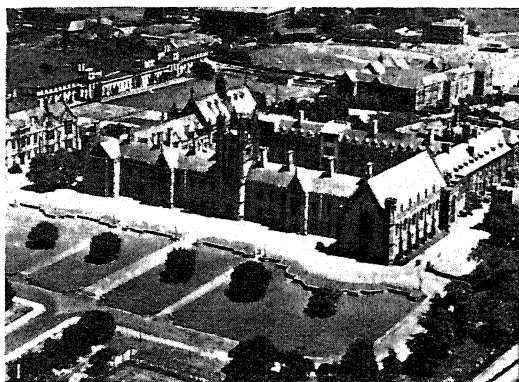
Sydney, New South Wales. Plan of the central districts on the south side of the harbour, showing the principal quays

stream. Its originally irregular and narrow streets are being rapidly replaced by fine buildings, spacious gardens, and wide thoroughfares, the total street mileage of the city proper being over 134 m.; suburbs 2,050 m. The entrance to the harbour, nearly 1 m. in breadth between Middle Head and Inner South Head, faces N.N.E.

The harbour extends 13 m. inland, and covers an area of 13,600 acres, or 21 sq. m., with a coastline of 188 m., so indented that the wharves, 14 m. of them, are close to the heart of the city. Named after Sir George Jackson (1725-1822), secretary to the British admiralty, the harbour is geologically a "drowned valley," has no large rivers bringing down silt, and has a depth of water at the heads of 80 ft., and at the wharves of from 30 ft. to 50 ft. The rise and fall of the tides ranges from 3 ft. to 6 ft., with an average of 3 ft. 4½ ins. In the fairway is a reef running parallel to the direction of incoming and outgoing vessels, leaving two channels of 40 ft. or more at low water. At least fifty vessels the size of the Queen Elizabeth could be com-

fortably accommodated at one time in the harbour. During the Second Great War Sydney was, from Jan., 1945, the h.q. of the British Pacific Fleet. The bridge across the harbour, opened March, 1932, is 2½ m. long, including approaches, with central span of 1,650 ft.; it cost £9,700,000 and contains 52,300 tons of steel. Its deck is 160 ft. wide, and gives a clearance for shipping of 170 ft.

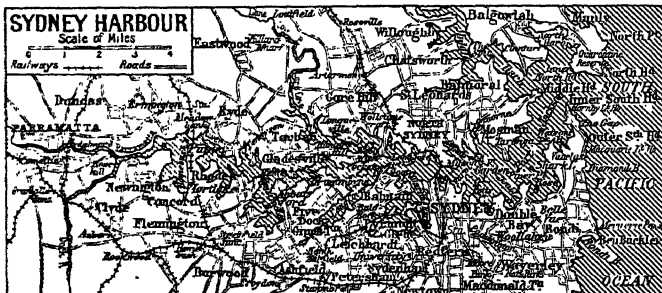
There are several graving docks, including the Captain Cook Graving Dock, opened 1945, which could take the largest vessel afloat; a number of floating docks and patent slips; extensive loading, unloading, and coaling plant; and facilities for storing and loading grain in bulk. The wharves were in private hands until 1901, when the harbour trust was formed. The Sydney harbour authority's annual revenue is £1,380,000. In 1946-47, 3,628 vessels entered, with a net tonnage of 5,836,808; cargo totalling 9,033,487 tons—the heaviest to that date—was handled in the year ending June 30, 1945. The light at the harbour entrance is visible for 30 m.



1. Air view of the main building of the University. 2. Façade of the Mitchell Public Library. 3. Elizabeth Street, looking N. to Circular Quay. 4. Shrine of Remembrance, erected after the First Great War, in Martin Place. 5. Approach to Harbour Bridge from the north. 6. Elizabeth Street, with Hyde Park on left. See also Bridge illus., p. 1424.

SYDNEY: BUILDINGS AND STREETS IN THE CAPITAL OF NEW SOUTH WALES

Photos, 1, 2, 3, 5 and 6, Australian News and Information Bureau; 4, Fox



Sydney Harbour. Map of the roadstead and chief suburbs

The city, which was incorporated 1842, has its main streets laid out to the cardinal points of the compass. With its suburbs it abounds in easily quarried sandstone, and its modern buildings invite comparison with any in Europe. The university, incorporated Oct. 1, 1850, is built of this stone in 15th century Gothic style, occupies a commanding position, has a hall 135 ft. long, 45 ft. wide, and 73 ft. high, and is surrounded by a park. There are five denominational colleges. The metropolitan cathedral of S. Andrew, in 14th century Gothic style, was consecrated Nov. 30, 1868; the foundation-stone of the first of its two predecessors was laid by Governor Macquarie, July 1, 1819. The R.C. cathedral of S. Mary was reopened, Sept., 1882, after being twice burnt. There are Anglican and R.C. archbishops.

Other buildings include some 200 churches, the Jewish synagogue, government offices, town hall (with fine organ), technical college, government house, post office, mint, observatory, art gallery, public libraries, museums, central rly. station, markets, schools, hospitals, conservatorium of music, etc. There are many parks, squares, and public gardens, of the first named those in the metropolitan area covering 4,728 acres, apart from the National Park of 36,300 acres and Kuringgai Chase, 35,322 acres, both remarkable for their natural scenery. About 5 m. from the centre of the city is Dacey Garden Suburb, covering 336 acres. The Zoological Gardens were in Moore Park until their removal in 1916 to Taronga Park. Water in abundance is obtained from the Nepean river.

There are underground rly., tram, and steam ferry systems. Coal is obtained from mines less than 100 m. distant. Manufactures include clothing, boots and shoes, pottery, glass, furniture, tobacco, carriages, and stoves, also distilleries, breweries, and machine shops.

Sydney is a favourite tourist resort, with a government tourist bureau, its harbour providing a delightful picnic-ground for holiday-makers; bays and bathing beaches mark the many miles of its wooded foreshores, and glorious panoramic views of rugged headlands may be obtained from almost any point of its coast-line. Manly, Freshwater, Narrabeen, Bondi, Bronte, Coogee, Maroubra, and Cronulla, surfing beaches on the Pacific littoral, are claimed to equal the beach of Waikiki and the surfing strands of Southern California and Florida. Mean temperature ranges from 72° F. in Jan. to 53° F. in July; mean annual rainfall, 46.46 ins. The first inter-colonial exhibition was opened here, 1870, and the first international exhibition, 1872.

Sydney, NORTH. Seaport of Nova Scotia, Canada. On Cape Breton Island, it is 15 m. N.W. of Sydney by C.N.R. Headquarters of the fishing fleet, its fine harbour exports coal and iron ore from neighbouring mines. Pop. 6,836.

Sydney, UNIVERSITY OF. Australian university. Founded in 1850, as a university for New South Wales, it received a royal charter in 1858. The ten faculties are: arts, economics, science, agriculture, medicine, dentistry, veterinary science, engineering, law, architecture. It has large modern buildings in 150 acres of grounds in Sydney, including the Fisher Library, laboratories, and a hospital. University extension lectures are carried on. Connected with the university are denominational colleges for Anglicans, Roman Catholics, Presbyterians, and Methodists; also a women's college, and an affiliated university college at Armidale. Statutory endowment is £100,000, and the number of students exceeds 8,000.

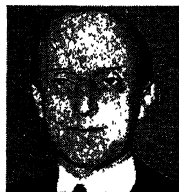
Sydney Bulletin, THE. Weekly newspaper of Australia. It was founded at Sydney in 1880 and has won a world-wide reputation

for the quality and pungency of its literary and political criticisms, its "national" standpoint, and its advocacy of the views of the farming community. Its cartoonists have included Phil May, Lavingson Hopkins, Norman Lindsay, David Low. It is issued by The Bulletin Newspaper Co., Ltd.

Sydney Morning Herald. Oldest daily newspaper in Australasia. Established in 1831, it was acquired in 1840 by Charles Kemp and John Fairfax. A few years later Kemp retired, and the property, which was formed into a limited company in 1916, has belonged ever since to members of the Fairfax family.

Syenite. In geology, an igneous rock of granite-like texture, consisting chiefly of orthoclase feldspar and mica, hornblende and augite. When a small quantity of quartz is present the rocks are called quartz syenites. So called from Syene, Egypt, syenite occurs in parts of Europe, N. America, Asia.

Sykes, SIR FREDERICK HUGH (b. 1877). British administrator. Born July 23, 1877, he entered the army and served in the S. African War. Qualifying as a pilot, he joined the R.F.C. During the First Great War he commanded the



Sir Frederick Sykes, British administrator

the R.N.A.S. in the Eastern Mediterranean, 1915-16, and was on the supreme war council at Versailles, 1917-18. At the Paris peace conference he was chief of the air section. Knighted in 1919, he was controller of civil aviation until 1922; for six years Conservative M.P. for Hallam; then went out to govern Bombay, 1928-33. He sat in parliament again for Central Nottingham, 1940-45. Sir Frederick, who had been chairman of government committees on meteorology, broadcasting, and miners' welfare, happily named his autobiography (1942) *From Many Angles*.

Sykes, SIR PERCY MOLESWORTH (1867-1945). British soldier, administrator, and writer. Born Feb. 28, 1867, he went from Rugby through Sandhurst and into the army. He travelled frequently through Persia and Baluchistan, discovering on his first journey, 1893, a range of mts. hitherto unmarked on any map. He was the first European to climb the volcano of Koh-i-Taftan.

Diplomatic service brought more knowledge of the same countries; a book, *Ten Thousand Miles in Persia*, made a success in 1902; and in the First Great War Sykes was sent to Persia to protect British interests. He raised the South Persian Rifles and commanded in the country until the end of the war. His standard *History of Persia* (2 vols.) appeared in 1915, the year in which he was knighted. Other books were *History of Exploration*, 1934; *Quest for Cathay*, 1936; *History of Afghanistan*, 1940. Sir Percy died June 11, 1945.

Syktyka. Capital of Komi-Zyrian (*q.v.*), an autonomous republic of the R.S.F.S.R. It is a centre of the timber and fur trades.

Sylhet. Dist. and town of Pakistan. Since 1947 in the prov. of E. Bengal, the dist. covers roughly the area formerly known as the Sylhet dist. of Assam, some 5,478 sq. m. in the fertile valley of the Surma. Rice is virtually the only crop, since annual rainfall averages over 100 ins. everywhere. Those of the pop. of 3,116,602 who could vote chose to be included in Pakistan in 1947. Sylhet town, on the Surma, has rly. communication with Calcutta and Chittagong. Pop. 19,300.

Syllabus (Lat., list). Literally, an abstract, and therefore a table of contents or a programme. In the R.C. Church the word is specially used for a list of errors officially condemned by the pope. One of the most important was that issued by Pius IX in 1864, which condemned eighty alleged errors or heresies. These covered philosophical speculations, free thought of every kind, Freemasonry and other secret societies, questions relating to the marriage laws, and ethical errors, and liberal ideas generally. Another syllabus, issued by Pius X in 1907, condemned the teaching of modernism under 65 headings. Whether such a pronouncement is to be regarded as an infallible utterance *ex cathedra* by the pope is a matter of dispute among Roman Catholics.

Syllogism (Gr. *syn*, together; *logizesthai*, to reckon). Typical form of deductive reasoning, in which, certain propositions having been laid down, something different from them follows as a necessary consequence: All men are mortal; Socrates is a man; therefore, Socrates is mortal. Every syllogism contains two premises and a conclusion; the major term is the predicate, the minor the subject,

of the conclusion. There are four modes: A (universal affirmative) all men are mortal; E (universal negative: no men are immortal); I (particular affirmative: some men are clever); O (particular negative: some men are not clever). There are also four kinds of figures, depending upon the relation of the middle term to the major and minor. See Deduction; Logic.

Sylph (Fr. *sylphe*, from Gr. *silphē*, a kind of beetle). Fairy-like being holding an intermediate place between the material and the immaterial and inhabiting the air, according to the mythology of the Rosicrucians (*q.v.*).

Sylt. One of the N. Frisian islands. The largest German island in the North Sea, it lies off Slesvig, opposite Denmark and Germany. With an area of 39 sq. m., it consists of a narrow bank 22 m. in length and generally less than a mile wide, with a wider peninsula stretching E. from the middle. Westerland in the middle, the chief village, has rly. connexions with the harbours at the N. and S. ends. Sand dunes fringe the shores, and sea-bathing attracts thousands of visitors normally. After the outbreak of the Second Great War, R.A.F. patrols were maintained over the seaplane bases at Sylt to prevent German aircraft from laying mines in British waters. On the night of March 19, 1940, Sylt was heavily bombed and the Hindenburg Dam, which connects the island to the mainland, was damaged. On May 11, 1945, units of the British 11th armoured division occupied the island.

Sylvester I (d. 335). Pope from 314 to 335. The son of Rufinus, a Roman, many legends have gathered round his name, including the famous forgery, the Donation of Constantine, recording the grants made by Constantine to the pope and his successors in the city of Rome. What is authentic is that the pope was represented by his legates at the council held at Arles against the Donatists in the first year of his pontificate, and that he took part in the council of Nicaea, 325. Sylvester was canonised as a saint, and his feast is kept on Dec. 31, the day of his burial.

Sylvester II (c. 945–1003). Pope from 999 to 1003. The first French pope, his name was Gerbert, and he was born at or near Aurillac (Auvergne), where he received his early education. By the influence of the emperor Otto I he was appointed to the cathedral school at Reims, and was made archbishop of Reims in 991.

Deposed by a synod presided over by the papal legate, Gerbert retired to the court of Otto III, whom he accompanied to Italy. In 998 he was made archbishop of Ravenna by Pope Gregory V, on whose death the following year he was elected pope. Sylvester died in Rome on May 12, 1003. Besides creating a metropolitan seat for Poland at Gnesen, and one for Hungary at Gran, Sylvester is famous for his scientific inventions, which included a pendulum clock and an hydraulic organ. He is also credited with the introduction to the W. of the use of Arabic numerals.

Sylvester, JAMES JOSEPH (1814–97). British mathematician. Born in London, Sept. 3, 1814, he was educated at the Royal Institution school, Liverpool, and S. John's College, Cambridge. Although second wrangler, 1837, he was unable, owing to the fact that he was a Jew, to take his degree at Cambridge until 1872, when religious tests had been removed. He became professor of natural philosophy at University College, London, 1837, professor of mathematics at Virginia university U.S.A., 1841, and professor of mathematics at the Royal Military Academy, Woolwich, 1855. On the foundation of the Johns Hopkins university at Baltimore, U.S.A., he was appointed to the chair of mathematics, 1877. In 1883 he became Savilian professor of geometry at Oxford. He died March 15, 1897.

Sylvine or **SYLVITE**. Native form of potassium chloride obtained from the Stassfurt potash mines. The mineral sylvite, as found naturally, contains about 20 p.c. of potassium chloride. Sylvine has an important use in spectroscopy (infra-red) since it is transparent down to a wavelength of 20 μ except for narrow absorption bands at 3.2 μ and 7.1 μ . See Potassium.

Symbiosis (Gr. *syn*, together; *bios*, life). In biology, term for a kind of partnership between living organisms of unrelated species; taking the form of associated existence for the purposes of mutual nutrition. Plants which live in this manner are dependent in various ways one upon another, and frequently join together in order to attain mutual advantage. One may absorb foodstuffs from earth and air and pass them on to the other; while organic compounds made in the green cells of a plant may be used in addition by the fungus, for example, living on it. Symbiosis is best seen in

the lichens, which are composite plants consisting of algae and fungi. The same phenomenon exists between certain flowering plants and fungi, in which case the fungus supplies water and foodstuffs from the ground, receiving from its partner organic compounds produced in the green leaves. *See* Commensalism; Mycorrhiza.

Symbol. Sign, abbreviation, or conventional mark used to denote an individual or a group, a substance, a process or operation, a relationship, etc. Symbols and symbolism have played an important part in the development of society, of civilization, and of the sciences. Some social symbols, such as crests, flags, seals, etc., were originally identification marks used in an illiterate age; but many of them in primitive communities, and some more recently, acquired a semi-mystical significance, and possessed a special capacity to arouse enthusiasm and to focus social activity. Consider, for example, the immensely wide influence of the Cross as the symbol of Christianity; consider the very different influence during the 20th century of the swastika and of the

hammer and sickle. The study of such social symbols throws a revealing light on problems of social psychology.

Most symbols are not of this social type, but are a specialised kind of shorthand introduced by workers in different fields to facilitate the expression of complicated ideas peculiar to the subject. Thus, in mathematics, chemistry, physics, biology, and social studies such as economics, there is an extensive and ever-growing body of symbols the use of which obviates lengthy verbal statements and enables complex chains of reasoning to be set out briefly, but in a form wholly unintelligible to those who have not mastered the particular notation. The progress of science has been much assisted by these time-saving and distinctive methods of written expression; but the intricacy of such symbolism greatly increases the preparatory study necessary before the non-expert can share their ideas or follow their arguments. Many branches of technology have their own systems of symbols, so that the plans of the technologist or the instruction

sheet of the technician are quite unreadable by the uninitiated.

Scientific symbolism developed first in mathematics; indeed, the progress of mathematics has depended largely on the growth and the aptness of the symbols for expressing either ideas or operations. The Arabic numerals, including the zero, which made possible decimal notation, are of fundamental importance. They gradually came into general use during the period from the 5th to the 16th centuries. The signs + and -, introduced in the 15th century, were not generally adopted until the 17th. The multiplication sign \times was invented by Oughtred in 1631; the division sign \div by Rahn in 1659; the sign of equality = by Recorde in 1557; the symbol $\sqrt{\quad}$ to denote a square root, by Rudolph in 1526; the exponent, to denote a numerical power, such as x^2 , x^3 , by Descartes in 1637; the sign for infinity ∞ by Wallis in 1655. During the 18th, 19th and 20th centuries numerous other new symbols have been introduced, particularly into the specialised applications of mathematics.

SYMBOL. SOME EXAMPLES OF CONVENTIONAL SIGNS USED IN MATHEMATICS AND SCIENCE

Mathematics				Astronomy	
+	(plus) addition, positive	\nless	not less than	●	new moon
-	(minus) subtraction, negative	∞	infinity	☾	first quarter
\pm	plus or minus	$f(x)$	function of x	○	full moon
+ve	positive	°	degrees	☾ or ☾	last quarter
-ve	negative	'	minutes (or feet)	☉	sun
=	equal	"	seconds (or inches)	☿	Mercury
\neq	not equal	π (pi)	ratio of circumference of circle to diameter = 3.14159265	♀	Venus
\equiv	identically equal	□	square	♁	earth
\times	multiplied by	△ or ▲	angle	♂	Mars
ab	a multiplied by b	∠ _{rt}	right angle	♃	Jupiter
$b(a+b)$	$a+b$ multiplied by b	△	triangle	♄	Saturn
\div	divided by	○	circle	♅	Uranus
a/b or $\frac{a}{b}$	a divided by b		parallel to	♆	Neptune
%	per cent	Pharmacy		♁	conjunction
‰	per thousand	℔	pound	♂	opposition
$\sqrt{\quad}$	square root	oz	ounce	♂	ascending node
$\sqrt[3]{\quad}$	cube root	3i or 3j	one ounce	♂	descending node
a^n	the number a multiplied together n times	3ij	two ounces	Biology	
a^{-n}	$1/a^n$	3iss or 3jss	one ounce and a half	♂ or ♂	male
$a^{1/n}$	the n th root of a	f 3	fluid ounce	♀	female
∴	therefore	3	drachm	♂ ♀	dioecious
∵	because	3i or 3j	one drachm	♂ or ♀	hermaphrodite
∴	divided by	℥	scruple	X	hybrid
∴	equals, as	℥ i	one scruple	♂	perennial
∝	is proportional to, varies as	0	pint	♂	tree
>	greater than	℥	minim	Electricity	
≧	not greater than	M	mix	- -	one cell
<	less than	R	recipe	- ---	battery of cells
				+ -	positive, negative poles, etc.

Symbolism (Gr. *symbolon*, a token). Conventional representation of an idea, person, or thing by something else which recalls it by some analogy or association. When employed to represent abstract ideas, or objects which cannot well be portrayed, especially in the religious and moral spheres, symbolism acquires an emotional significance, as with the national flag, the crescent, or the cross.

It is an essential element in primitive, hieratic, and heraldic art. Most of the gods and goddesses in Egyptian, classical, and Indian mythology, and many saints in the calendar, have their appropriate symbols. Early Christian symbolism, of which such examples as the lamb, dolphin, fish, dove, and palm-branch are common in the catacombs, was largely derived from Jewish and pagan sources. Numbers were treated symbolically by many ancient nations, as the Babylonians, Jews, and Greeks; thus to the Jews 7 denoted perfection, 4 the earth, etc. See *The Symbolic Language of Ancient Art and Mythology*, R. P. Knight, new ed. 1902.

Symbolistes. Term applied to the school of French poets, influential in the latter years of the 19th century, who used symbolic methods of expression. In reaction from the Parnassian school of *Hérédia*, *Samain*, etc., who developed a highly finished technique of objective description, the Symbolistes sought to perfect a method of indirect suggestion of ideas. Sources of the movement are found in the work of *Charles Baudelaire* (q.v.), and the master of the school was *Stéphane Mallarmé* (q.v.). See *Parnassians*; *Rimbaud*; *Vers Libre*. Consult *The Heritage of Symbolism*, C. M. Bowra, 1943.

Symington, WILLIAM (1763-1831). Scottish engineer. Born at Leadhills, and educated at Glas-



William Symington,
Scottish engineer
After D. O. Hill

gow and Edinburgh universities, in 1787 he patented an improved form of steam engine, which he applied in conjunction with Patrick Miller to paddle-wheel steamers. In 1802 the *Charlotte Dundas* tug-boat was fitted with a further improved form of Symington's steam engine, which proved highly successful. Although the inventor's ideas were the foundation of modern steamships, he died in poverty in London, March 22, 1831.

Symmachus, QUINTUS AURELIUS (c. A.D. 345-c. 405). Roman orator and author. Educated in Gaul, he became leader of the pagan aristocracy in Rome, was a man of high character, and held several high administrative offices. He pleaded hard against the anti-pagan enactments of the emperor Gratian, urging that "not by one path alone can the great mystery be approached," but was banished for a time from Rome. His extant works comprise panegyrics, epistles, reports on affairs in Rome, and fragments of orations.

Symmetry. In geometry, correspondence of parts with regard to a middle plane, each element of geometrical form having its counterpart on the opposite side of that plane. A sphere is thus symmetrical about any plane passing through its centre, as is an ellipsoid.

In algebra, a function is said to be symmetrical with respect to certain letters, when those letters can be interchanged without changing the form of the expression. Thus $a^2 + 3a^2b + 3ab^2 + b^2$ is symmetrical with respect to a and b , since an interchange of a and b does not alter the expression. Symmetry enables many expressions to be written down at sight in algebra, so tending towards ease of solution of problems, and also enables errors to be detected from want of symmetry.

Symmetry (Gr. *syn*, with; *metron*, a measure). In zoology, correspondence of different parts of an organism about a line or a plane through it. In all the higher animals it will be found that, if the body is divided down the central line of the back, the two halves will be very much alike. If the human body is thus divided, the two halves are exactly alike externally, and mainly alike internally. This is known as bi-lateral symmetry; and in most cases it is indicative of an active life.

In the lower phyla of the animal kingdom this rule no longer prevails. There is no right and left side, but the body is the same all round, being either tubular or more or less globular. See *Anatomy*; *Man*.

Symonds, JOHN ADDINGTON (1840-93). British man of letters. Born at Bristol, Oct. 5, 1840, he was educated at Harrow and Balliol College,

Oxford, where he took the Newdigate prize, and an open fellowship at Magdalen. Severe study led to a breakdown in health, and after settling at Clifton for a time, he had to go abroad. The last 20 years of his life were largely spent at Davos Platz. He wrote under almost constant pain, and often without books of reference, but his output was large, and was remarkable for its picturesque style and for its humanity. He died at Rome, April 9, 1893.



John A. Symonds,
British man of letters

Symonds's first book was *An Introduction to the Study of Dante*, 1872; it appeared in a new edition, as did his last book, *Walt Whitman: a Study*, in the week that he died. His greatest work, *The Renaissance in Italy*, took him 11 years to write, 1875-86; summarised in one vol. by Lieut.-Col. A. Pearson, 1893, it was reissued in 7 vols., 1897-98. His most characteristic effort was the sonnet sequence, *Animi Figura*, 1882. His other books include studies of the Greek poets, *Lives of Shelley*, *Sidney*, *Ben Jonson*, and *Michelangelo*, a volume on Shakespeare's Predecessors in the English Drama, English versions of *Benvenuto Cellini's Autobiography* and *Carlo Gozzi's Memoirs*, and masterly translations of the sonnets of Michelangelo and Campanella. Consult *Life*, H. F. Brown, 1895.

Symond's Yat. Beauty spot on the river Wye in Herefordshire. The Yat, i.e. gate, is a narrow opening, 600 yards across, between two hills at the neck of a meander of the river. Within the river-loop, which is 4 m. long, is a hill, also called Symond's Yat, 740 ft. in height, from which is obtained a magnificent view. See *Wye*.



Symond's Yat, Herefordshire. Bend of the Wye as it passes (right) the Yat, with (left) the hills known as the Dowards

Symons, ARTHUR (1865–1945). British poet and critic, born Feb. 28, 1865. One of a London



Arthur Symons,
British poet

group of poets and writers influenced by the French symbolists, he came into prominence with a first volume of poems, *Days and Nights*, 1889. The more widely-

known *London Nights* appeared in 1895. Editor of *The Savoy*, 1896, he became associated with Aubrey Beardsley. As critic rather than poet his best work was done, e.g. *Studies in Two Literatures*, 1897; *The Symbolist Movement in Literature*, 1899; *Spiritual Adventures*, 1905; *Figures of Several Centuries*, 1916. He wrote also on painting, music, drama, and dancing, and made translations of Hofmannsthal's *Elektra*, and from Baudelaire, Verhaeren, and D'Annunzio. Symons died Jan. 22, 1945.

Sympathy (Gr. *syn*, with; *pathos*, feeling, suffering). The natural, often inexplicable, inclination to share the feelings and sufferings of others, opposed to antipathy. Physiologically, the increase or diminution of the activity of a bodily organ as a result of similar conditions in another bodily organ. The chief connecting links between the two are the nervous and vascular systems. Sympathetic phenomena are common in illness; other instances are the "cracking" of the voice, and sneezing as the effect of light.

Symphony (Gr. *symphonia*, a sounding together). Musical composition, essentially a sonata (*q.v.*) for orchestra. The term was first used to designate the instrumental prelude and interludes in a choral work. The operatic prelude in particular developed into an overture. In the French type there were two slow movements separated by a quick one, but the Italian overture consisted of two quick movements with a slow one between them, and it is from the latter that the symphony developed.

The experiments and searchings after a definite form were gathered up and fixed by Haydn, to whom justly belongs the title of father of the symphony. While in the service of Prince Esterhazy he produced more than a hundred symphonies. Mozart wrote 49, the three greatest being those commonly numbered 39 in E flat,

40 in G minor, 41 in C (the Jupiter). Beethoven composed only nine, but into them he infused a depth of emotion and expression unknown to his predecessors, and perhaps not surpassed by any successor. Other eminent composers of symphonies are Schubert, Schumann, Mendelssohn, Brahms, Bruckner, Mahler, Borodin, Tchaikovsky, Glazounov, Dvorak, Berlioz, Franck, Sibelius, Elgar, Sir A. Bax, R. Vaughan Williams.

A modern development called the symphonic poem owes its origin to Liszt. It differs from the symphony in having for its basis a more or less definite programme, in place of emotional expression or pure thought, its form being modified to suit the programme. The development of both symphony and symphonic poem has been made possible by the improvements in old instruments and the inventions of many new ones. See *Harmony*; *Music*.

Symphoricarpus. North American shrub popularly called snowberry (*q.v.*).

Symposium (Gr. *syn*, together; *pinein*, to drink). Originally in ancient Greece the wine-party that followed a banquet. Plato gave the name to one of his Socratic dialogues represented as having taken place at such a gathering. There is a similar work by Xenophon with the same title. The feature of these works was the expression of opinions by various individuals, and the word symposium has thus come to be applied to any collection of opinions or essays on a particular subject.

Synagogue (Gr. *synagōgē*, a gathering, from *synagein*, to bring together). In the history of Judaism, an assembly of Jews for worship and religious instruction, and hence a building specially set apart for that purpose. Local synagogues were scattered throughout Palestine in early times, but as a focus of national life the institution of the synagogue has been dated from the great exile when the Jews, deprived of the services of the Temple, gathered together for worship and for mutual help.

In time the synagogue was used not only as a place of worship, but also as a court of law by the local sanhedrin or tribunal of elders, and as a school. There was no appointed priest, and the worship, which included prayers and the reading and exposition of the Law and the Prophets, was conducted by the *chazan* or reader with less formality than the Temple services. At the east end was the ark containing the scrolls of the law, the reader's platform, and the perpetually burning lamp.

Modern synagogues retain the essential character of those in the past, though in recent times the tendency has been to restrict them to religious uses. The first synagogue in England was at Oxford in the reign of William II, and as late as the reign of George II there were only two synagogues in the whole of Great Britain. The oldest in England is at Bevis Marks, London, built in 1701 and now scheduled as an ancient monument.

A college of learned elders, known as the Great Synagogue, is



Synagogue. Interior of the Great Synagogue in Aldgate, London, from the west end. This synagogue was destroyed in a German air raid, May, 1941. The chazan in the almemar or pulpit is reading the law at the Sabbath service. All the men in the congregation are wearing talliths

said to have been founded by Ezra at Jerusalem to secure the codification and exact transmission of the Law and the Prophets with commentaries. As this body is not mentioned in the O.T. or Apocrypha its very existence has been doubted. See Jews; Temple.

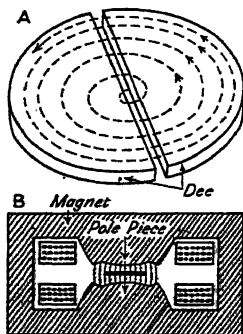
Synchrotron. The most complicated and powerful of a number of devices used to accelerate atomic particles to very high energies. One electron or one proton accelerated through 10 million volts would acquire an energy of 10 MeV. Potential differences of this order are, however, unrealizable in practice, and the problem is to achieve the same result by applying a manageable voltage (say 15,000 to 50,000) many times over to the same particle.

LINEAR ACCELERATOR. This consists of a series of electrodes, in the form of metal tubes set in line with short gaps between, and connected alternately to the terminals of a high-frequency oscillator. A source of particles is placed at one end and the whole enclosed in an evacuated cylinder. A positive particle (e.g. a proton or a deuteron) leaving the source when the first electrode is negative is accelerated into it. By the time it emerges the voltage has reversed, the second electrode is now negative, and the particle is again accelerated across the gap. The process continues, so that the particle attains a final energy equal to the voltage of the oscillator (say 50 kV) multiplied by the number of electrodes. Since, however, each electrode has to be considerably longer than the one before, the total number practicable is severely limited.

CYCLOTRON. To overcome this difficulty E. O. Lawrence devised the cyclotron, in which the tubular electrodes are replaced by two flat semicircular boxes or dees (fig. A) set in an evacuated container between the pole-pieces of a powerful electromagnet (fig. B). The vertical magnetic field bends the path of the particles to a semicircle inside each dee; the reversal of the voltage accelerates them across the gap between the dees, and the higher

speed thus attained increases the radius of the semicircle in the next dee. The extra length of the new path exactly balances the higher speed, so that the particles always arrive at the gap just in time for the next reversal of voltage. This condition is known as resonance, and the magnetic field is adjusted till it is reached. "Focusing" the particles in the central plane of the dees is achieved by a slight decrease in the magnetic field towards the edges. The upper limit of energies obtainable is set in the first place by the size of the magnet. With pole-pieces 5 ft. in diam., a field of 10,000 gauss, and an alternating voltage of 50 kV, deuterons make about 160 revolutions and reach an energy of 16 MeV.

SYNCHRO-CYCLOTRON. For higher energies, the decrease in magnetic field required for focusing and the increase in mass of the particles predicted by the theory of relativity ($q.v.$) as their speed approaches that of light, both lead to an extra lengthening of their semicircular path which is not balanced by a corresponding increase in velocity, so that they arrive late at the gaps and resonance is lost. To meet this the frequency of the oscillating voltage is progressively reduced during the outward spiralling of



Synchrotron. Diagram showing, A, the dees of a cyclotron; B, the electromagnet with the dee box in the lines of force

one batch of particles, then raised again and a new batch brought out. Each batch is collected and held together by an automatic synchronising effect: the particles cross the gaps while the voltage is still rising; any particle slightly ahead of time is therefore subjected to a lower voltage and accelerated less than the average, any particle behind time meets a higher voltage and is hurried on. The Berkeley frequency-modulated (F.M.) or synchro-cyclotron, with pole-pieces 184 inches in diam., a peak voltage of 15 kV, and frequency modulating from 12.6 to 9 Mc/s, can deliver deuterons at 190, protons at 340, and α -particles at 380 MeV.

BETATRON. The cyclotron will not work for electrons, because with their much smaller mass they move much faster and the relativity effect is much greater. In

the betatron or magnetic-induction accelerator a magnetic field is again used to produce a circular path for the electrons (β -particles). The magnet is in the form of an iron yoke with a central bar surrounded by an evacuated glass ring, or doughnut, round which the electrons circulate. Moving electrons are equivalent to a current, and the doughnut acts like the secondary coil of a transformer. The primary coil is wound round the yoke and excited by alternating current. When this is increasing the magnetic flux through the doughnut increases, and induces an increased secondary current, i.e. accelerates the electrons. At the same time the increasing field holds them to a circular (rather than a spiral) course. With a doughnut 74 in. in diam., and a power input of 200 kW at 60 c/s, energies of 100 MeV have been obtained.

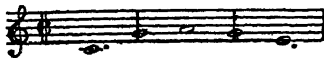
SYNCHROTRON. This was first devised for electrons as a combination of betatron and synchro-cyclotron. At the centre is a small betatron which accelerates the electrons to about 1 MeV by magnetic induction. They are then delivered to a wider orbit where they are further accelerated by a frequency-modulated voltage. To prevent them, however, from spiralling rapidly out of the instrument, the current to the electromagnet is made to increase as the acceleration builds up, so that the orbit remains practically circular. The same principle is applied to positive particles in the proton-synchrotron. Here the advantage is that the magnetic field has to be maintained over a narrow circular orbit only (instead of the whole area of the dees). In a proton-synchrotron with an orbit 32 ft. in diam. particles travel in all some 100,000 miles and reach an energy of 1,300 MeV.

Syncline (Gr. *synklinein*, to lean together). In geology, the dipping of the strata inwards towards the axis of an earth fold, producing a trough-shaped or basin-like arrangement of the strata. See Anticline.

Syncope (Gr. *syn*, together; *koptein*, to cut). In music, a temporary alteration of accent effected by prolonging a sound from a normally weak place in the bar over a normally stronger one. The consequent cross accentuation produces a very stimulating effect.

If long applied in all the parts, syncope may result in changing the time, which thus ceases to

be really syncopated though it may look so to the eye. The term, from Gr. *synkopē*, cutting short, originated from an early practice, when black notes were not so much used, of cutting certain of the notes by the bar lines:



Syncope. In language, loss of a vowel or consonant, or even of an entire syllable, in the middle of a word: ev'ry for every, ne'er for never, can't for cannot, since for sithence. *Pron.* sin-ko-pee. *See* Accent.

Syncope. Failure of the heart's action resulting in fainting (*q.v.*).

Syncretism (Gr. *synkretismos*, combination). Union in face of a common enemy, referring to the ancient Cretans who, while continually quarrelling among themselves, resented all outside interference. In theology, it is an attempt to reconcile different religious communions. The Lutheran Calixtus in 1645 formulated a scheme for uniting all Christian parties in a single church.

Syndic (Gr. *syndikos*, one who helps in a court of justice). Word used for an official whose powers and duties vary from place to place. In ancient Greece the syndics were public advocates appointed to represent the state, and in the Roman judicial system they represented corporate bodies in actions at law. In England today the word is used in the university of Cambridge for delegates appointed for certain specific purposes, *e.g.* to look after the university press, etc. In Italy the *sindaco* is the chief official, the mayor, of a town.

Syndicalism (Fr. *syndicat*, organization of workers). Revolutionary movement that originated in France towards the end of the 19th century. It aimed at the transfer of the control of individual industries to the workers engaged in them, this to be brought about by direct action and not parliamentary methods. Syndicalists proposed that the workers should first transform their trade unions into industrial unions by amalgamation; then form a federation of industrial unions and a national federation of trade unions; and finally link these two in a general confederation of labour including all producers and distributors. The general strike, it was thought, would be an all-powerful weapon. A council of representatives from all the unions would administer

national concerns and replace parliament. These ideas underlay the formation of the Confédération Générale du Travail in 1895, and caused a large part of the trade union movement of France to remain aloof from political Socialism. The movement resulted in widespread strikes in 1909; but the outbreak of war in 1914 caused a split, some leaders who had been anti-nationalist now supporting the government. Revolutionary syndicalists in England inspired numerous strikes in 1911; but they made little progress, principally because of the close relationship between the trade unions and the Labour party. Syndicalism expressed itself in the U.S.A., Canada, Australia, etc., through the once famous Industrial Workers of the World. *Consult* Socialism and Syndicalism, P. Snowden, 1913.

Syndicate. A term literally meaning a body of syndics, but now generally applied to a body of persons banded together to carry out some business enterprise, a temporary organization preparatory to a more permanent one. In its more correct signification of a body of syndics, the word is used in the university of Cambridge.

Synecdoche. Figure of speech in which a part is understood to mean a whole. Examples are "hands" for workmen, and "the redcoats are coming," *i.e.* the soldiers. Synecdoche is a special form of metonymy (*q.v.*). *Pron.* sin-ek-dokee.

Syngé, JOHN MILLINGTON (1871–1909). Irish dramatist. Born at Rathfarnham, near Dublin, April 16, 1871, he graduated at Trinity College, Dublin, travelled on the Continent, lived for some time in the Latin quarter, Paris, and went to the Aran Isles and Gal-



J. M. Syngé,
Irish dramatist

way Bay to study the life of the peasants. His work is characterized by great strength and rugged beauty. He combined in his plots extreme realism with intense imagination, and in his dialogue the poetic with the earthy; and achieved great success as a dramatist. The following are his best plays: *The Shadow of the Glen*, 1903; *Riders to the Sea* (one act), 1904; *The Well of the Saints*, 1905; *The Playboy of the Western World*, 1907; *Deirdre of the Sorrows*, 1910. Volumes of poems include

Queens; *In Kerry*; *Beg-Innish*; *The Passing of the Shee*; *The Curse*; and prose studies, *The Aran Isles*; *In Wicklow*; *In West Kerry*. Syngé died in Dublin, March 24, 1909. *Pron.* Sing.

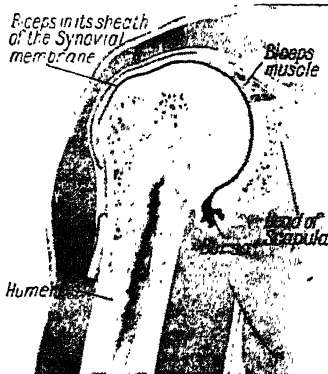
Syngenesious. Term applied in the description of flowers to the condition in which the anthers of the stamens are united while their filaments are free, as in *Compositae*.

Synod (Gr. *synodos*, assembly). Eccles. term for a meeting of churchmen for deliberation on church affairs. In the early Church a universal synod, to which the bishops of the whole Church were summoned, was usually known as a general or oecumenical council; a national synod was attended by clergy of one nation; a provincial synod was an assembly of the clergy of one province or patriarchate. The convocation of Canterbury is an existing example of the provincial synod. A diocesan synod was convened by the bishop for consultation with his clergy.

Among Presbyterians (*q.v.*) a synod is a court coming between the general assembly and the local presbyteries. Such a synod must include at least three presbyteries, each represented by the minister and one elder. The term has sometimes been applied to assemblies of a more special character, *e.g.* the synod of Dort (*q.v.*). *See* Elder.

Synonym (Gr. *syn*, with; *onyma*, name). Word expressing substantially the same idea as another word. It may have a wider connotation, and coincide with the other word in one of its applications, or it may originally have been identical in meaning, and by the associations it has acquired, or by some other process of differentiation, it may express a slightly different sense. The Teutonic, French, and Latin elements in the English language have made it unusually rich in synonyms; *e.g.* the words kingly, royal, and regal have only slightly different uses. In scientific nomenclature, the term synonym is applied to names of genera, species, etc., which have been rejected in favour of others with better claims. *See* Homonym.

Synovial Membrane. Thin, strong membrane which lines the interior of joints. It secretes a fluid which acts as a lubricant to the joint. Inflammation of the synovial membrane is termed synovitis, and may be due to a sprain or injury to the joint, or to certain constitutional diseases, such as rheumatism or tuberculosis, which must have appropriate treatment. The joint becomes



Synovial Membrane. Diagram of bones and muscles of shoulder joint; the synovial membrane is shown in black

swollen, painful, and hot. Mild attacks are usually relieved by hot fomentations, resting the joint, and applying counter-irritants. In severe cases permanent and extensive changes occur in the joint.

Syntax (Gr. *syn*, together; *tassein*, to put in order). Theory of the proper use and arrangement of words in a sentence. It forms the second great division of grammar, the first dealing with morphology, the theory of word-formation. Syntax may be historical, an investigation of its development in the same language; comparative, the attempt to establish the principles which regulated it in prehistoric times, by the aid of existing languages; descriptive, rules for the proper employment of the individual parts of speech, of cases, moods, and tenses; the theory of simple and compound sentences.

Synthesis (Gr. *syn*, together; *thesis*, placing). Putting of parts together to make a whole; the opposite of analysis. Although used occasionally in the study of language, the word is principally a scientific term, applied to the method of reasoning which starts with elements (axioms, general principles, established truths) and combines them to obtain a new idea or to reveal a fresh relationship or (in chemistry) perhaps to make a new substance. The argument is throughout deductive, applying general propositions to particular cases. Synthesis has been called the method of exposition; analysis, the method of discovery; but synthesis often leads to discovery by indicating the need to correct general principles. See *Analysis*.

Synthetic Material. Product that has been artificially built up from simpler substances, not obtained by extraction from a

natural source. The term is derived from synthesis (Gr., putting together). Synthetic materials are of two kinds: those which in molecular structure are exact chemical duplicates of natural products; and those having properties similar to natural products to which they are chemically dissimilar.

In the first class is quinine, which can be obtained by extraction of the natural substance from cinchona bark, or synthesised from other substances. When analysed, natural and synthetic quinine are chemically identical. Similarly, common salt may be mined from rock salt deposit or evaporated from sea water, or it may be synthesised by reacting hydrochloric acid and caustic soda. Pure sugar from beet or sugar-cane is chemically the same as sugar synthesised from carbon, oxygen, and hydrogen.

On the other hand, neoprene, buna, and other synthetic rubbers, which are basically combinations of lime and coal, closely resemble and for many purposes replace natural rubber; but chemically these products are quite unlike it. Synthetic wool, one variety of which is made from milk, and synthetic leather, bear no chemical relation to fleece or hides. Synthetic silk, from wood cellulose, has a close resemblance to real silk; but chemically bears no relation to the product of the silkworm. The same remark applies to chocolate synthesised from wood, and flour from sawdust.

Coal is one of the chief bases of synthetic materials. From benzol, a distillate of coal tar, is synthesised oil of bitter almonds, used for scenting soap; while toluol, another distillate of coal, yields saccharine, a synthetic sugar. Aniline (*g.v.*), a colourless oily substance, was synthesised from coal tar and yielded dye identical with that derived from the indigo plant. Synthesis of coal tar and its products yields dyes of some 11,000 colours and shades. Cellulose, a fibrous stiffening matter in plant cell walls, provides another basis. Treated with nitric acid, cellulose produces pyroxylin, or cellulose nitrate, from which are synthesised artificial ivory, leather, and sponge. Cotton is synthesised from the fibres constituting the bark of trees, and coal by subjecting plants to intense heat and pressure. Caustic soda can be synthesised from salt and water, and carbon disulphide from sulphur and coke carbon. Most gemstones have been synthesised in the

laboratory, but usually these are more costly than the natural stones.

In some cases the synthetic materials are much more than substitutes; indeed, for certain purposes, they are better wearing and more adaptable than the natural products that they simulate. More than 400,000 new combinations of molecules have been constructed to produce synthetic materials, and millions are theoretically possible. See *Artificial Gem Stones*; *Buna*; *Coal*; *Cellulose*; *Chemistry*; *Neoprene*; *Nylon*; *Plastics*; *Resin*; *Rubber*; *Silk*, *Artificial*; *Wool*, *Artificial*. Consult *Chemistry in the Service of Man*, A. Findlay, 1947; *Synthetic Resin Chemistry*, S. R. W. Martin, 1947.

Syon House or **Sion House**. Seat of the duke of Northumberland. In Middlesex, between Brentford and Isleworth, and facing Kew Gardens, it is a large quadrangular building of three storeys, surmounted since 1874 by the stone lion which once stood on old Northumberland House, near Trafalgar Square. Notable for its gardens, it occupies the site of the monastery of SS. Saviour and Bridget, founded 1415, and suppressed, 1539, by Henry VIII, who used it as a prison for Catherine Howard. The monastery was granted by Edward VI to the protector Somerset, who converted it into a palace and laid out the grounds. In 1604, with the manor of Isleworth, it was granted by James I to the 9th earl of Northumberland and his heirs. The existing structure was attractively remodelled by Robert Adam about 1760.

Syphilis. Contagious disease, formerly called the pox. This disease, most usually acquired during sexual intercourse, is caused by a micro-organism, the *Treponema pallidum* or *Spirochaeta pallida*. Its name is derived from the name Syphilus, an imaginary swineherd in a Latin poem, *Syphilus sive Morbus Gallicus*, written in 1530 by Hieronymus Frascatorius. There are two schools of thought concerning the origin of the disease in Europe. One thinks that syphilis has developed from the tropical disease yaws, which is caused by an organism indistinguishable from *T. pallidum* and which obtained world-wide distribution with man's earliest migrations from Africa. This school also considers that syphilis has existed for centuries in Europe, being confused with leprosy in early writings. The other postulates that it was

brought from the West Indies by the sailors of Christopher Columbus, after which it was conveyed to the armies of both sides at the siege of Naples in 1495 and, when the army of Charles VIII disbanded, was introduced in rapid succession to most of the European capitals, being taken subsequently to India by Vasco da Gama in 1498 and appearing in Canton in 1505.

The responsible organism, which was discovered by Schaudinn in 1905, is a spirochaete shaped like a corkscrew, which, if a special technique is used, can be seen in material from early lesions. Wassermann in 1906 devised a blood test which is most valuable for diagnosis, though positive results are not obtained in all stages of the disease. Other tests, *e.g.* the Kahn, were evolved subsequently.

The infection is spread by sexual intercourse in the vast majority of acquired cases, though accidental infection may, rarely, arise from kissing or by contact with moist matter from an infected patient. Infection from pipes, drinking vessels, etc., while not unknown, is extremely rare. Infection acquired by tattooing with a contaminated needle, shaving with a contaminated razor, or by blood transfusion are also exceedingly rare, though the entry of the organism through an abrasion (of *e.g.* the finger), if applied to affected parts, or by means of a human bite is less uncommon. Children born of untreated or improperly treated syphilitic mothers may be found to have the disease (congenital syphilis). Subsequent transmission to the third generation, while possible, is very uncommon.

Symptoms of Primary Syphilis

The incubation period, *i.e.* the time from the date of actual infection to the beginning of symptoms, is from 9 to 90 days, usually 3-4 weeks. The first, or primary, stage is the development of a small pimple, which rapidly becomes an ulcer, or chancre, at the site of entry of the organism. The adjacent lymph glands are also characteristically enlarged. The primary chancre is seen on or around the genitalia in 95 p.c. of cases; in extra-genital forms it is usually found on the lips. Sometimes the chancre is apparently absent, or it may be concealed, *e.g.* within the genital passage of the female or about the anus in homosexuals. Diagnosis is achieved by finding the responsible organism in material taken from the sore. The blood test, though helpful, is not absolutely reliable at this

stage, as the blood usually takes a few weeks to become positive and, indeed, about one half of chancres in men are noted while the blood test is still negative.

Even without treatment the chancre will often heal spontaneously and, after a varying period, usually of 4-8 weeks, but possibly as long as six months after the appearance of the sore, the secondary stage is reached. Then there may be a generalised pink or red rash, which usually does not irritate, enlargement of the lymphatic glands, and multiple ulcers, usually smaller than the chancre and sometimes insignificant, on the genitalia and in the mouth. There may occasionally also be headaches, sore throat, hoarseness, loss of hair, painful, red eyes, or pains in the bones. Sometimes the symptoms are so slight as to pass unnoticed by the patient, but the blood test for syphilis is invariably positive in the secondary stage.

Period of Latency

With no or with improper treatment the secondary symptoms will resolve with time and, though in the early years a relapse may occur, the patient enters a period of latency, during which there are no clinical signs of the disease but damage to vital organs may be taking place. This period of latency usually lasts 5-10 years, though it may last only a few months or a lifetime. The next stage is the tertiary, which makes itself apparent in a pattern depending on what structures are affected. Painless lumps (gummata) may develop, which when near a surface may break down into ulcers. These usually affect the skin, but sometimes the mouth or nose is involved with much tissue destruction. Internal organs too are sometimes affected. The main blood vessel leaving the heart (aorta) may be subject to a syphilitic inflammation (aortitis) which may result in angina pectoris or heart failure; while an actual stretching of the weakened aortic wall produces a ballooning of the vessel, which often ruptures, with the instantaneous death of the patient (aortic aneurysm). Sometimes the central nervous system is affected by a syphilitic process of the brain (paresis; general paralysis of the insane) or of the spinal cord (locomotor ataxia, *q.v.*). Other forms exist causing blindness (optic atrophy) and deafness.

The congenital form of syphilis is not accompanied by a primary chancre, but the infant develops

symptoms similar to those of secondary syphilis in the first few weeks of life. There is commonly a nasal discharge or signs of nasal obstruction (snuffles), and the bones also may be affected. A latent period follows, and, though the disease may remain latent, tertiary symptoms such as gummata or involvement of the central nervous system may develop after the age of six onwards, usually at puberty, but may be delayed until the patient is in the early twenties or, rarely, the thirties. These late manifestations also include red, painful, sore eyes which may terminate in blindness (interstitial keratitis), deafness, and a swelling of the knees (Clutton's joints). The face is often characteristic and the nostrils may point forward ("opera glass" nose) and the permanent upper central incisors may show notching (Hutchinson's teeth). Affection of the bones (periostitis) is also not uncommon.

Syphilis is usually completely curable in the primary, secondary, and early latent stages, and also in infants. The unborn child may be effectually protected by the treatment of the affected mother. In the later stages a cure is less certain, for though further damage may be prevented, existing tissue destruction cannot always be made good. Much, therefore, depends upon early diagnosis, and a doctor or a venereal diseases clinic (where treatment is free and confidential) should always be consulted whenever any abnormality appears on the genitals.

Methods of Treatment

For centuries prolonged treatment with mercury was used with indifferent results. In 1910 Ehrlich, a German, introduced an organic arsenical compound which he called salvarsan (arsphenamine) and which was injected into the blood-stream with the intention of killing the parasite without injuring the individual. This compound was later improved and rendered less toxic (neo-arsphenamine), and weekly injections of this drug combined with weekly intra-muscular injections of bismuth were, with suitable rest periods, given for at least a year to effect a cure. Penicillin (*q.v.*) was shown in 1943 by Mahoney to be effective against syphilis. This substance is non-toxic, and good results may follow one or more injections daily for one or two weeks. Combinations of penicillin with the older treatment are also used. After the completion of this treatment a

prolonged period of observation, during which repeated blood tests are made, is necessary to exclude relapse. Such a relapse, which might still cause serious after-effects, might be free of symptoms and detectable only by a blood test at a time when prompt action could still effect a cure. Possible involvement of the central nervous system is excluded by an examination of the spinal fluid (lumbar puncture), which should be carried out on all cases before discharge. The period of observation should be not less than two years, though only eight or so visits to the doctor may be necessary in this time.

Congenital forms of syphilis can be almost eliminated by the routine testing of all pregnant women and by adequate treatment before the birth of the child. Premarital examinations are also helpful. The risk of acquiring syphilis increases in proportion to promiscuity, but is reduced by the adoption of prophylactic measures, the most satisfactory for both sexes being the use by the male of a condom during intercourse. In the male the risk may be further reduced by the adequate washing of the genitalia

54 m. by rly. and 32 m. direct S. of Catania, which has superseded it as a seaport. The fine cathedral embodies the remains of a Doric temple; the museum contains a valuable collection of pre-Christian antiquities. Chemicals, salt, wine, and earthenware are the principal articles of trade. Pop. 53,160.

Founded in 734 B.C., Syracuse became the chief Greek colony in Sicily. It grew until the circuit of the city walls was 16 m., and under the tyrant, Gelon, was in 485 B.C. the largest city in Sicily. Hiero defeated the Etruscans in a naval engagement in 474, and the inhabitants repulsed the Athenians who laid siege to the city, 415-413. Dionysius, tyrant after 405, extended his authority over E. Sicily and S. Italy. After a long siege, 214-212, the city was captured by the Romans, and was sacked. Archimedes was killed during the operations. Syracuse was in Gothic possession until 535 A.D., the Saracens destroyed it in 878, and the Normans acquired it in the 11th century. Various ruins attest its great history: 10 m. of the walls, Greek fortifications and a theatre,

Doric temples, a Roman amphitheatre, Roman houses, and Christian catacombs all attract the archaeologist and tourist.

When Allied forces landed in Sicily on July 10, 1943, Syracuse was captured the

first day by units of the 8th army in a combined operation in which glider-borne troops played a part. The Italians offered no resistance, the Germans very little, and the port was secured intact. Though there was scattered damage to churches and palaces, the harbour was found to be free of obstructions.

Syracuse. Third city of New York, U.S.A., the co. seat of Onondaga co. It stands at the head of Onondaga Lake, 150 m. W. by N. of Albany, and is served by several rlys. and the Erie and Oswego canals, which connect it with Lakes Erie and Ontario and the Hudson and St. Lawrence rivers. It is the seat of Syracuse university (1849). Manufactures include motor vehicles, bicycles, typewriters, agricultural implements, foundry and machine-shop products, clothing, chemicals, boots and shoes, furniture, and cement. Once an Iroquois capital, Syracuse was settled in 1805, and known by various names until 1819. In 1825 it was incorporated as a village, and in 1847 became a city. Pop. 205,967.

Syr-Daria (Gr., Lat. Jaxartes; Syr. Sihon). River of Soviet Central Asia. Its headstream, the Naryn, rises W. of the Tien-Shan, in Kirghiz S.S.R., near the Chinese border, and the main river flows 1,500 m., mostly N.W. through Kazakh S.S.R., to fall into the Aral Sea. In parts navigable, it is at other places overgrown and muddy. Before the Revolution it gave its name to a province of Asiatic Russia, which had Tashkent as its capital.



and surrounding parts with soap and water after intercourse, drying on clean linen, and applying a mercury ointment containing 33½ p.c. calomel; but no form of prophylaxis can be guaranteed as certain.

R. E. Willcox, M.B.

Syra OR SYROS. Island of the Aegean Sea, one of the Greek Cyclades (*q.v.*). It lies S. of Andros and N.W. of Paros. A rocky, mountainous, and barren island with an area of 30 sq. m., it has remains of the old Aegean civilization, and in Syra, or Hermopolis (*q.v.*) one of the chief Greek seaports.

Syracuse (Ital. Siracusa). Seaport of Italy, in S.E. Sicily, capital of the prov. of Syracuse. It is



Syracuse, Sicily. North facade of the cathedral, incorporating the columns of the Doric temple which previously occupied the site. Top, left, remains of the Greek theatre, hewn in the living rock

SYRIA: ANCIENT LAND OF THE LEVANT

Edgar Stern-Rubarth, Ph.D., and Robert Machray

This article first describes the republic of Syria as proclaimed in 1941, and then gives an outline of what Syria has meant historically. See articles on Aleppo; Damascus; Latakia; Orontes, and other towns and physical features of Syria. See also N.V.

Syria (Arab. Esh-Scham) is an independent republic of S.W. Asia. With Lebanon (*q.v.*) it was part of what, from Babylonian days in about the 27th century B.C., was called Suri (the West ?), later Aram by the Hebrews, Retennu by the Egyptians, and later still Suriya by the Turks. Its Arab inhabitants called the area Esh-Scham. This Syria of antiquity comprised the entire land between Asia Minor and the Sinai pen., between the Mediterranean and S. Mesopotamia, embracing N. Mesopotamia.

The Syrian republic covers a territory est. at 54,500 sq. m., a large part of it being desert, El Djésire, and has a pop. of (1943) 2,860,411, including Latakia, with 432,507, and Jebel Druse, with 80,128 inhabitants. Its capital is Damascus, pop. (1943) 286,310; other cities are Aleppo, 320,167, Homs, 100,142, Hama, 71,391, and Latakia, 36,687 inhabitants. More than 80 p.c. of the people are Muslims, of whom the great majority are Sunni Muslims. Druses number c. 160,000; Alawiyya, c. 300,000; Ismailians, c. 25,000. There are some 600,000 Christians.

After the First Great War (*v.i.*), Syria was detached from the Turkish empire and, with Lebanon, was placed under French mandate,

April 25, 1920, by the supreme council of the Allied powers meeting at San Remo, a decision confirmed by the League of Nations. July 24, 1922. At first the two countries were divided into five territories, but in 1925 two of these, Damascus and Aleppo (sanjaks of Hama, Homs, Damascus, Hauran, Aleppo, and Deir ez Zor, and the autonomous sanjak of Alexandretta, *q.v.*), were joined to form Syria. The sanjak of Alexandretta was ceded to Turkey, 1939. The high commissioner, Gen. Dentz (*q.v.*), declared for Vichy in 1940. On June 8, 1941, British and Free French forces invaded Syria, to counteract German influence and infiltration, Vichy forces retiring July 16. Syrian independence was proclaimed by Gen. Catroux, Free French c.-in-c., Sept. 27, and on Dec. 27, 1943, an agreement was signed between the French national committee of liberation and Syria transferring the French powers under mandate to the Syrian govt. from Jan. 1, 1944. The last British and French troops left in April, 1946. Syria was an originating member of the Arab League. (For later history, see N.V.).

The Syrian govt. consists of a president and a cabinet of seven ministers, including the premier, with a parliament elected for four

years. This form of govt. dates from 1930.

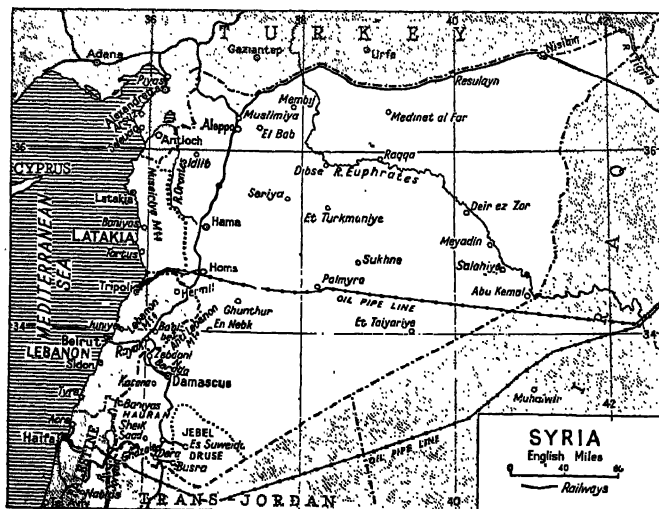
The country, bordered on the N. by Turkey, the E. and S.E. by Iraq, in the S. by Transjordan, in the W. by Palestine, Lebanon, and the Mediterranean Sea, is in its western half covered by mts. and hills continuing the Amanus range. These mts. slope steeply to the sea while in the E. they lose themselves slowly in the desert. The Orontes, which crosses the frontier with Turkey, is the chief Syrian river fed by these mts.; those flowing E. ooze away in the desert through which, however, the Euphrates cuts from N. to S.E. The temp. is high in summer, with from four to five months' drought in the W., from eight to nine months in the interior; in winter the temp. is low, and there are rain and snow. Near the coast the vegetation is Mediterranean in type—pines, evergreen oaks, olive trees, fruit-trees, and the vine in the valleys; palms grow only in a few favoured valleys. The fauna is poor, and similar to that of Palestine and Iraq.

People and Products

The pop. is a mixture of many ancient peoples, Sumerian, Phoenician, Hebrew, Druse, etc., with their Arab conquerors; there are Kurds, Armenians, and Turks in the N., Circassians, and, in the E. steppe, pure bred Arab beduins. Though not a good agricultural country (only about 13.5 p.c. of the soil is cultivated), the bulk of the pop. lives on the soil, producing wheat, millet, barley, maize, sesame, and legumes; mulberries, olives, tobacco, citrus fruits, figs, wine, and cane sugar. What little industry there is takes the form for the most part of handicrafts. Silk and embroideries are made in Damascus, some textiles in Aleppo, silk in Latakia. In olden days Damascus was famous for its weaving (whence damask) and its sword-making and cutlery (Damascene blades).

The 450 m. of the Syrian rly. link Aleppo with the Bagdad rly. to the N., and with Damascus and Transjordan to the S. Beirut, capital of Lebanon, serves as Syria's chief port, and is connected by a narrow gauge rly with Damascus. There are some 5,000 m. of roads, usable by motor traffic, and several airports, one of which serves the French Marseilles-Saigon air line.

With its very long history and a prehistoric past producing finds of the early palaeolithic period (caves of Antelias), Syria has long been



Syria. Map of this independent republic of S.W. Asia

studied by archaeologists. Baalbek (Heliopolis), now in the Lebanon republic, Marath, Palmyra, Djerablus (Hieropolis), Zenobia, Rakka, etc. have yielded valuable finds of the many civilizations that followed each other; and Damascus itself that, with an age of 4,000 years, claims the title of the world's oldest city, is rich in traces of its past, though much was lost in 20th cent. bombardments.

HISTORY. A country of the unbalanced geological and geographical nature of historical Syria was unable to develop a unified civilization. Traces of individual, regional prehistoric civilizations are found, however, in what was later Phoenicia—neighbourhood of Beirut—and N. Syria; during the later Palaeolithic period there were frequent exchanges of populations across the land-bridge between Asia and Africa. A population, chiefly Semitic, came under the domination of another ruling race, perhaps the Philistines, who belonged to the Aegean civilization, and from about 2000 B.C. documentary evidence appears, e.g. of the town building empire of the Hyksos. The earliest allusions to Syria, however, are found in the inscriptions of the Sumerian town rulers c. 2500 B.C. Assyrian kings penetrated to the Syrian coast c. 1850 B.C.; Egypt was in trade relations with Syro-Phoenician ports, e.g. Byblos, and after, in the 18th century B.C., the Hittites conquered Syria, Thutmosis I and III gained the whole country to the Euphrates from them, c. 1500.

Emergence of Modern Syria

Present-day Syria became Hittite again 1450 B.C. until, c. 1200, the Aramaeans and, a century later, the Assyrians penetrated into the country. After centuries of fighting, Tiglath-pileser III took Damascus in 732 and turned Syria, similar in size to the present republic, into an Assyrian prov.; Nebuchadrezzar turned it into a prov. of new Babylon; and Cyrus the Elder made it a Persian satrapy. Conquered, in turn, by Alexander the Great, it became the heart of the Seleucid empire with Antioch as capital; and when the Seleucid empire disintegrated, Rome stepped in, and Pompey made Syria a Roman prov., 64 B.C. One of the earliest seats of Christianity, Syria gave its language (Aramaic) and script to many of the oldest Christian documents.

After short interludes during which, e.g., Nabataean and Palmy-

rene kingdoms ruled parts of Syria, and after its last temples, e.g. the great temple to Venus at Baalbek, had been converted into churches by Constantine the Great, Syria was conquered and annexed by the Mahomedan Caliphs in A.D. 636, Damascus in 661 becoming their capital. The crusades, between 1098 and 1268, established several smallish states in Syria, e.g. the principality of Antioch and the county of Tripoli; these gave way to the sultans of Egypt of whom Saladin, 1138-1193, was outstanding. Mameluk and Mongol conquests followed, the latter with terrible devastation, before, in 1516 the Turkish Sultan Selim I conquered Syria. With a short interlude during which Mehemet Ali of Egypt held it, 1831-33, Syria with the other Arab states remained part of the Ottoman empire until 1918.

It was an uneasy possession; the Druse tribes, a Mahomedan sect of their own, fought for their independence in the 17th century and their leader, Prince Fahreddin, was executed by the Turks in 1635; governing pashas made themselves virtually independent



Syringa. Foliage and flowers of the sweet-scented Mock Orange

of the Sublime Porte; and Christian massacres such as took place in Damascus and in the Lebanon in 1860, provoked intervention by the western powers, giving France a number of special rights in the country. During the First Great War, Syria was the scene of disastrous rearguard battles by the Turkish forces, and was occupied from Oct., 1918, to Sept., 1919, by British and French troops, the latter holding the coastal areas according to the Sykes-Picot treaty of 1916, whereas the British forces, and with them Emir Feisal (see Feisal I) and his adviser, Col. Lawrence, occupied Damascus. An Arab kingdom under Feisal was proclaimed in March, 1920, but French opposi-

tion, leading to armed clashes, forced Feisal to leave Damascus July 25, and the state proclaimed by a Pan-Syrian congress collapsed.

FIRST GREAT WAR. Gen. Allenby, after forcing the Turks out of Palestine in Sept., 1918, advanced through the upper Jordan valley and, after beating down stiff opposition, reached Katana, 12 m. S.W. of Damascus, Sept. 30. Joining there with the Arab army which had captured Ghazale, Ezra, and Sheikh Saad, Damascus fell to the combined forces Oct. 1. On the following day, 1,500 Turkish prisoners were taken 17 m. N.E. of Damascus and the remnants of the Turkish army, about 17,000 men, of whom 4,000 were effectives, fled. Rayak, Beirut, Homs, and Tripoli were occupied by Oct. 15, Aleppo by the 26th; Syria was completely occupied before Oct. 31, Turkey signed the armistice under which her troops had to withdraw beyond the Cilician Gates.

Bibliography. Prophets, Priests and Patriarchs, H. Luke, 1927; Nationalist Crusade in Syria, E. P. MacCallum, 1928; Les États de Syrie, Gruvel, 1931; Syria and Lebanon, A. K. Hourani, 1945; Syria, An Historical Appreciation, R. Fedden, 1946; Syrian Pageant 1000 B.C.-A.D. 1945, Castle, 1948.

Syringa. Genus of shrubs of the family Oleaceae, of which the best known is lilac. The mock orange usually known as the syringa belongs to the family Saxifragaceae. A native of the Himalayas, it is a hardy shrub bearing cymes of sweet-scented creamy-white flowers, used as orange blossom. See Lilac.

Syringe (Gr. *syrinx*, pipe). Hand pump for projecting a stream of liquid. It consists in its principal form of a cylindrical barrel in which slides a piston, and which has a nozzle at one end. Syringes for irrigating wounds, etc., comprise a rubber bag, connected with a nozzle by a long tube. See Hypodermic Injections.

Syringomyelia. Disease of the spinal cord. It is characterised by the formation of cavities in the cord and degeneration of the nerves. The most important symptoms are the loss of the capacity to distinguish painful impressions when applied to the skin; progressive wasting of the muscles; and neuralgic pains in the limbs.

Syrinx. In Greek mythology, a nymph of Arcadia of whom the god Pan became enamoured. To escape his violence she prayed the gods to change her into a reed. Her request was granted, and Pan made him-

self a pipe of the reed into which she had been changed.

Syrmia. Dist. of Yugoslavia, comprising the E. portion of Slavonia between the Danube and the Save. Vukovar is the chief town.

Syrup (Arab. *sharab*, beverage; cf. *sherbet*). Term loosely applied to any liquid holding sugar in solution. Sugar syrups are often flavoured with the juice of fruits, and in France and other countries fruit *sirups*, flavoured with raspberries, gooseberries, currants, strawberries, lemons, or oranges, constitute an article of commerce. The syrup used in pharmacy is a more or less saturated solution of refined sugar. See *Shrub*; *Sugar*.

Systolē (Gr. *systellein*, to draw together). Phase of the heart-beat during which the heart muscle is in a state of contraction. It is thus the opposite phase to diastole (*q.v.*). Rhythmic contractions of the heart are due to impulses originating in the right auricle. See *Heart*.

Szyzyg (Gr. *syn*, with; *zygon*, yoke). Point in the moon's orbit when it is in conjunction or in opposition, i.e. when it is in a line with the earth and the sun. The moon is in *szyzyg* when it is new or full. *Pron.* Sizizij.

Szamos or **SOMESUL**. River of Rumania. It rises in the N.W. of the plateau of Transylvania in two headstreams, the Great and Little Szamos, which unite at Dés (Dej), whence the river flows N.W. to join the Theiss (Tisza) after a total course of about 300 m.

Szarvas. Town of Hungary, in the co. of Bekes. It stands on the left bank of the Körös, 85 m. S.E. of Budapest, and is a market town and agricultural centre on the Alföld. Pop. 29,000.

Szczecin. Polish name for the Baltic port of Stettin (*q.v.*).

Szechwan or **SZICHUAN**. Large inland prov. of China. Its name means four rivers, and these are perhaps the Min, To, Fu, and Kiating, which flow N. to S. into the Yang-tse; but that river also crosses the prov., and in the S.W. are the Yaling and tributaries. The surface of Szechwan is divided into (1) the Red Basin, a plateau with a thick layer of red sandstone in the central and E. portions, forming a fertile area about the Chengtu plain; (2) a series of mountain masses, which reach 16,000 ft. in the W. and are generally above 12,000 ft.

Winter is mild enough for cereals to grow, and the summer monsoon allows of rice cultivation. Tung oil is a leading product, and others are

beans, potatoes, sugar, tobacco, and white wax. Mineral wealth is potentially great but little exploited. Gold, silver, lead, antimony, iron, coal, and salt are mined.

Chengtu is the capital of the prov., while Chungking was the wartime capital of China, 1938-46. Other cities are Wanhhsien, Kiating (Loshan), Kweichow, and Tzeliutzing. Area, 144,996 sq. m. Pop. 45,845,804.

Szeged. Second city of Hungary. It stands on the right bank of the Theiss (Tisza), just below its confluence with the Maros, 118 m. by rly. S.E. of Budapest. The town hall is a fine rococo structure; the Gothic cathedral and the museum are other buildings of importance. There are a university and an appeal court. The Franciscan monastery has a fine library and a museum of antiquities. Iron bridges connect the old town with a new suburb across the river, which carries a large trade by barges. Soap, paprika, paper, salt, and cloth are manufactured.

Szeged is the chief commercial centre of the Alföld. The river bank is lined with quays, and the city is protected from floods by a great dike. In 1879 the old town was mostly destroyed and 2,000 people lost their lives in a disastrous inundation. Rlys. from the Alföld converge on the city, which is the main junction in S.E. Hungary for Rumania and Yugoslavia. It was fortified by the Turks, who held it for 160 years before 1688. The Russians captured Szeged, Oct. 11, 1944, during their advance on Budapest.

Szentes. Town of Hungary, in the co. of Csongrád. It is 28 m. by rly. N. of Szeged on an affluent of the Theiss (Tisza). Formerly frequently damaged by river floods, it is now well protected by dikes. It is an important agricultural centre on the Alföld. Pop. 32,000.

Szent-Györgyi, ALBERT (b. 1893). Hungarian biochemist. Born in Budapest, Sept. 16, 1893, he completed his medical training there before being wounded in the First Great War. Having been an assistant or research worker at several European universities and held a chair at Groningen during 1922-26, he came to Cambridge for four years. Returning to his own country, he was a professor at Szeged until 1938, when he received the chair of biochemistry at Budapest. His research work led to the first production of pure vitamin C, the anti-scorbutic element in many foodstuffs; and knowledge of vitamin H. It also

brought him the Nobel prize for medicine, 1937.

Szeredi, JUSTINIAN GEORGE (1884-1945). Hungarian ecclesiastic and scholar. Son of a stonemason, he was born at Deaki, April 23, 1884, and educated at Rome university. One of the world's leading authorities on canon law, he was on the commission which prepared a codification of that law. In 1927 he became archbishop of Esztergom, and later primate of Hungary and cardinal archbishop. Towards the end of the Second Great War he was interned by the Germans, and died March 29, 1945.

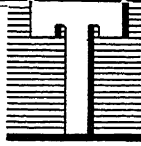
Szigeti, JOSEPH (b. 1892). Hungarian violinist. Born in Budapest, Sept. 5, 1892, he studied under Hubay, and made his début at 13. He toured England with Busoni, Melba, and McCormack, and was professor at Geneva conservatoire, 1917-24. The first of many American tours, 1925, preceded several world tours. A dazzling technique allied to power of dramatic interpretation made him acclaimed one of the world's leading violinists. He published violin transcriptions of many works; also his memoirs, *With Strings Attached*, 1947.

Szolnok. Town of Hungary, capital of the co. of Jasz-Nagykun-Szolnok. It stands at the confluence of the Zagyva with the Theiss (Tisza), 57 m. S.E. of Budapest, and is a rly. junction. It trades in agricultural produce by rly. and steamboat. Troops of Malinovsky's army captured Szolnok, Nov. 4, 1944, during his advance on Budapest. Pop. 29,000.

Szombathely. Town of Hungary, in Vas co., 32 m. S. of Sopron, on several rlys. Its fine cathedral is the seat of an R.C. bishop. On the site of the Romans' capital of Pannonia, the town shows many relics of their occupation. Around it is a district yielding wine and crops; it makes agricultural machinery and textiles, and has flour mills and sawmills. Pop. 34,700.

Szymanowski, KAROL (1883-1937). Polish composer. Born at Timoshovka, Ukraine, Sept. 21, 1883, he studied at Warsaw conservatoire under Noskowski, winning a first prize for composition in 1905. During the First Great War he was imprisoned in Russia; having escaped, he became professor of composition and director of the state conservatoire at Warsaw, 1922. He died at Lausanne, March 29, 1937. He composed a *sinfonia concertante* for piano and orchestra; two violin concertos; two operas, *Hagith*, and *King Roger*; and much piano music.

THE direct ancestor of the modern letter T was the ancient Phoenician and Hebrew *tau*, meaning simply a mark, and therefore the very simplest and to this day the most common form of mark, namely a cross, **X** or **†**. Probably this is the mark **✕** or **†** referred to in Ezekiel 9, v. 4. The Greeks, who also called the letter *tau*, regularised the vertical and horizontal nature of the two strokes and moved the horizontal to the top, though in the earliest Chaldean inscriptions it is sometimes found at the foot of the vertical,



thus: **└**. The small, or lower case, t reverts **└** to the intersecting cross, and is derived from the minuscule form used in Latin manuscripts. For the sake of speed the cross bar was written first, from right to left, the pen being then taken back in a curve, without leaving the paper, to a point above the centre of the cross bar ready for the downward vertical stroke, **└**. This characteristic curve of the pen has been retained in the t of the printed type, as has the curved **└**. This character has modern base.

T Twentieth letter of the English and Latin alphabets. It is a hard dental or teeth-sound, to which the soft *d* corresponds. Its normal sound, that of *t* in *tent*, is considerably modified by the accent. Before long *u*, after an accented vowel, it takes the sound of *ch*, as in *nature*. In *mature*, however, the accent is on the last syllable. Before *ia*, *io* it takes the sound of *sh*, as in *partial*, *cautious*, unless *s* precedes, as in *digestion*, *question*, although here some prefer to pronounce *queschun*. T is frequently silent between two consonants, as in *castle* and *listen*.

In combination with *h* it forms what is really a separate sound with two distinct forms, one hard, the other soft, e.g. *think*, and *smooth*, corresponding to those of the modern Greek *θ* and *δ*. As a rule, *th* is hard at the beginning and end of words, although there are many exceptions, e.g. *the*, *this*, *then*, *booth*, *smooth*. Between the vowels, it is generally soft in words not originally Greek or Latin, e.g. *leather*, *mother*, *together*, but hard in those that are, e.g. *author*, *catholic*. In a few words from the French, e.g. *Thomas*, *thyme*, it is a simple *t*. See Alphabet; Phonetics.

Taal (Dutch, language). Name formerly given to Afrikaans (*q.v.*), the language spoken in S. Africa by Europeans of Dutch origin.

Tabard. Official cloak worn by heralds, and also by trumpeters and drummers of the British household cavalry when in full uniform. A tabard possesses broad front and back parts, with wings covering the shoulders. In the heralds' tabard the back and front parts and shoulder wings are emblazoned in the proper tinctures with the royal arms; in that of the trumpeters and drummers they are embroidered with the royal badge and cipher. See Herald.

Tabard Inn, THE. Ancient hostelry in Southwark, near the S. end of London Bridge. It is famous as the inn from which Chaucer's Canterbury Pilgrims set out on their journey to the shrine of S. Thomas. After the Great Fire of 1666 it was rebuilt as the Talbot, but its last vestiges disappeared in 1873. See Canterbury Tales.

Tabasco. Maritime state of Mexico. Bordered N. by the Gulf of Campeche, it is watered by the Usumacinta and Grijalva rivers,

and covers an area of 9,782 sq. m. Agriculture is the staple industry, rice, maize, sugar, cacao, and vanilla being produced. The capital is Villa Hermosa (San Juan Bautista). Pop. 285,630.

Tabernacle (Lat. *tabernaculum*, a small hut). In Israelite history, the tent set up by Moses at Sinai, and used as a sanctuary during the wanderings. According



Tabard Inn. Courtyard of the old London hostelry, rebuilt and renamed the Talbot after the Great Fire from a drawing about 1780

to the oldest source, the Elohist narrative in Ex. 33, Moses set it up far from the camp, and entered it to commune with the Lord.

Post-exilic writers describe the tabernacle as an elaborate structure constructed of costly materials provided by free-will offerings. According to these documents, Ex. 25-27, 30, 31, 35-40, Num. 3, 4, 7, the tabernacle stood in the midst of the camp, surrounded by a fenced enclosure, containing an altar and laver of bronze. The tent itself, an oblong structure, had three sides boarded, and the E. side hung with curtains, while the top was covered with sheets of various materials. The larger part of the tent, called the Holy Place, contained the golden altar of incense, table of shewbread, and golden candlestick. The inner part, or Holy of Holies, screened by a veil, contained the ark (*q.v.*), and was entered only by the high priest, on the day of atonement. The



Tabernacle. Reconstruction, according to post-exilic writers, of the sanctuary set up by Moses and carried by the Israelites throughout their wanderings in the wilderness

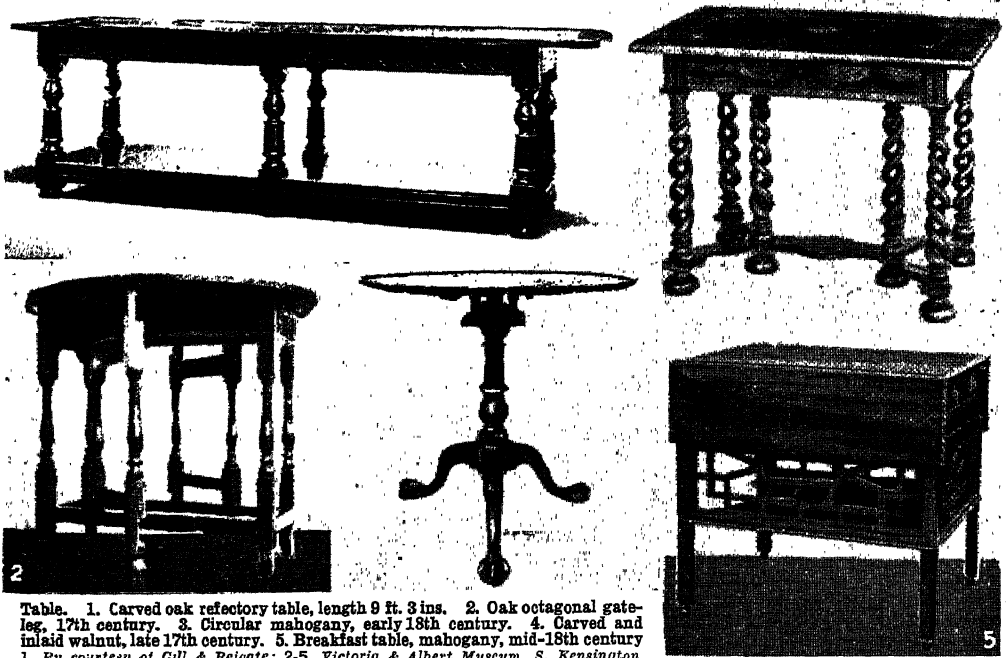


Table. 1. Carved oak refectory table, length 9 ft. 3 ins. 2. Oak octagonal gate-leg, 17th century. 3. Circular mahogany, early 18th century. 4. Carved and inlaid walnut, late 17th century. 5. Breakfast table, mahogany, mid-18th century. 1. By courtesy of Gill & Reigate; 2-5, Victoria & Albert Museum, S. Kensington

tabernacle was served by priests, and the Levites took it to pieces and carried it when the people journeyed.

In the R.C. church the tabernacle is the name given to the receptacle for the consecrated Host. The name is also applied in cognate senses to a niche for an image, a reliquary, and the abbot's stall. *See* Jews; Monstrance; Temple.

Tabernacles, FEAST OF. Hebrew festival celebrating the completion of the harvest. Also called the feast of ingathering, it was kept for seven days in Oct., during which worshippers lived in booths of green boughs, perhaps in allusion to those used by labourers in vineyards. All males were commanded to keep the feast in Jerusalem, but it was not regularly observed before the exile (Neh. 8, c. 16). Besides the harvest it commemorated the wanderings of Israel in the wilderness. The festival was an occasion of popular merry-making, and is still observed by orthodox Jews (Lev. 23, Num. 29, Deut. 16, 31). *See* Feast.

Tabgha Skull. Human skull found at Tabgha, Palestine. Discovered in 1925, it is that of an adult male and has been estimated to be more than 50,000 years old. It represents the long-headed or dolichocephalic type, the oldest human race in Europe, and is similar to the Neanderthal remains

found near Düsseldorf in 1859. *See* Anthropology.

Tablature. System of musical notation used from the 15th to the early 19th centuries for certain instruments. There were two principal varieties. One, employed for the organ and clavier, chiefly in Germany, indicated by letters the notes to be played, the different octaves and chromatic inflections being shown in various ways. The time values, suggestive of the stems and crooks of our quavers and semiquavers, etc., were placed above the pitch letters. The other kind of tablature, much more generally used, indicated where the finger should be placed on the fret, stop, or key, and its exact signification therefore depended on the number and tuning of the strings on the lute or other instrument.

These strings (or holes in the case of a pipe) were represented by lines, on which were written either numbers 1, 2, 3, etc., or letters a, b, c, etc. Both had the same meaning, and were not the names of notes. Time values were shown as above. Guitar tablature began similarly, but in the early 17th century a kind of shorthand system was introduced, by which whole chords were indicated.

Table (Lat. *tabula*). Smooth, flat, elevated surface on which articles can be placed. The word is used mainly for an article of

furniture, and by extension for the provisions placed thereon. There are various compounds, some, e.g. tablespoon, associated with the furnishing of the table for meals. The altar, or communion table, is sometimes known as the Lord's Table (*see* Altar). Table money is an allowance granted to officers of high rank in the army, navy, and air force to enable them to discharge the duties of hospitality in their official capacity; also the fee paid by a visitor playing at a bridge or other card club. Table is also used for a hard surface on which something is written or engraved to form a permanent record, for instance the Ten Commandments or the Twelve Tables. (*See* Decalogue; Twelve Tables.)

Tables of the Roman patricians were made of precious woods, finely inlaid, or of bronze. English tables were quite narrow at first, people sitting down to meals on one side only. Smaller tables were more solid, occasionally lavishly decorated. In the Jacobean period, tables were of solid oak, with moulded edges and heavily carved legs. Under Charles I wings were added, which gave rise to the gate-legged type. Pier-tables, or consoles supporting mirrors, are side tables, often bowed, with projecting bracket legs, which originated in the Italian Renaissance. Characteristic examples of the Louis

periods had heavily carved brackets in the form of acanthus leaves or human figures. Those of the Empire and of the Adam brothers were of classic style. Later came folding and combination tables. The dining table which could be extended by a screw to take in an extra "leaf" or leaves was characteristic of the 19th century. As with most domestic furniture, the 20th century trend has been towards austere simplicity of design, the only innovation being the sliding extension to the small dining table, and the introduction of steel. On the other hand there have been various adaptations of older models, especially of the Jacobean refectory table. *See Furniture.*

Tableau-Vivant (Fr., living picture). Motionless representation by living persons of scenes from history, mythology, or fiction, or of noted pictures or statuary. It is said to have been invented by Mme. de Genlis (1746-1830).

Table Bay. Bay of the Cape Peninsula, S. Africa. On the N.W. side, it was first visited by Antonio de Saldanha in 1503 and called Saldanha Bay. The first English ships to visit the bay arrived in 1591, and the first Dutch in 1595. From 1620 onwards Table Bay became a port of call for ships proceeding to the E. On the S. side of the bay is Cape Town, and farther S. lies Table Mountain.

Tableland. Elevated stretch of level or flat land. Central Spain, Arabia, Southern India (the Deccan), and the Sahara Desert are all examples of tablelands. *See Plateau.*

Table Mountain. Name of several mts in South Africa. (1) Mt. at the N.W. end of the Cape Peninsula, 3,582 ft. high and 1 m. long. The summit is flat, and was first ascended by Antonio de Saldanha in 1503. Dense white clouds frequently overhang the summit during the summer, forming the so-called "tablecloth." (2) Mt. in Natal, E. of Pietermaritzburg, between the Umgeni and Inanda rivers. (3) Mt. in the Orange Free State, 8,000 ft. high. Also called Platberg and Thaba N'Chu, it is about 3 m. E. of Harrismith. *See Cape Town.*

Tables. Any collection of data arranged in tabulated form for easy reference. Such are the tables in ready reckoners, multiplication tables in arithmetic, and tables of logarithms. Astronomical tables are tabulated data for the prediction of movements of the heavenly bodies. The earliest were the Hakimite Tables of the planets com-

puted by Ibn Junis, of Bagdad (950-1008), and named after the Caliph Hakim. Kepler published in 1627, at Ulm, the Rudolphine Tables, which remained an authority for more than a century, and have in principle never been superseded. Lunar tables are lists of numerical data of the elements of the moon and of the moon's orbit, used for calculating the position of the satellite. *See Nautical Almanac.*

Tablet, THE. London weekly R.C. newspaper and review. It was established, May 16, 1840, under the editorship of Frederick Lucas (1812-55), and was edited 1884-1920 by J. Snead-Cox. Douglas Woodruff became editor in 1936.

Table Talk. Title of several notable volumes of things said on many themes by great men and recorded by their admirers. Such are: *Table Talk* of Martin Luther, edited by J. Aurifaber, 1566; *Table Talk* of John Selden, by his amanuensis, Richard Milward, 1689; and *Table Talk* of Samuel Taylor Coleridge, by his son-in-law, H. N. Coleridge, 1835.

Table Tennis or **PING-PONG.** Indoor game, based on lawn tennis. It is played on a table of standard size, 9 ft. by 5 ft., with a net 6 ins. high. The ball must weigh not less than 2.40 grammes nor more than 2.53 grammes, and must be not less than $4\frac{1}{2}$ ins. nor more than $4\frac{3}{4}$ ins. in circumference. The racket can be of any material, size, or weight, provided it is not white and does not reflect, but the type in popular use is of rubber-covered wood.

In the late 19th century several kinds of indoor tennis were played on tables. A British patent taken out in 1891 by James Gibb refers to cork balls, clamp posts, and wooden rectangular rackets covered with some kind of cloth to give a twist to the ball. The game played with this equipment was completed by the scoring by one player of 21 points, as in table tennis. Gibb also introduced the celluloid ball. It was the sound that this ball made when patted slowly backwards and forwards over the net which led to the name of ping-pong. From 1899 to 1904 ping-pong, played with long-handled, vellum-faced rackets, became a craze in the U.K. There were few homes in England without a set. Then suddenly it died; and apart from a sudden burst of interest in central Europe 1905-10, the game remained dead until 1921, when the Ping Pong Association was revived. In 1922 this became the Table Tennis Asso-

ciation, and in 1926 the English Table Tennis Association. The association favoured the use of the rubber-faced racket, which had been tentatively used towards the end of the earlier craze. In 1926 an International Table Tennis Federation was formed.

Within a year the Hungarian players proved themselves unbeatable with the new type of racket, and maintained their leading position until the Second Great War. The greatest exponent of the game, Viktor Barna, was a Hungarian who became a naturalised British subject. World table tennis championships at Wembley in 1948 received entries from 28 nations, and attracted an audience of 20,000. Players from Czecho-Slovakia established themselves as holders of top place in world ranking, with the U.S.A. second, England third, and Hungary fourth. Individual champions were (women) G. Farkas, Hungary; (men) R. Bergmann, a naturalised British subject. England had not produced a world champion since Fred Perry, lawn tennis player, in 1929. In England, in 1948 there were 260 leagues and 5,000 clubs, with a combined membership of 100,000.

In a game each player has the service five times in succession. The ball must not be volleyed, but must bounce both in the server's court and in the receiver's court before being returned. As already stated, the game is won when one player has scored 21 points, but after a score of 20-all the winner must score two clear points. The game has become a strenuous athletic contest.

Table Turning. Practice, sometimes called typtology, formerly common at spiritualist séances, and often pursued as a social amusement. Two or more persons sit round a light table with the tips of their fingers laid on it. The table presently gives spasmodic jerks, spells out sentences by tapping the floor repeatedly, while one of the persons recites the alphabet, and sometimes it turns round or moves about. Faraday demonstrated that it is often due to unconscious muscular action on the part of the sitters. *See Séance; Spiritualism.*

"Tabloid." In the U.K. a proprietary name for a small medicinal tablet or lozenge. In the U.S.A. the word is not proprietary, and has been applied not only to a medicinal tablet, but by analogy to newspapers presenting the news in highly concentrated and stimu-

lating form, the more readily as such papers are almost all of smaller size than the usual.

Taboo or **TABU**. Polynesian word denoting persons, places, things, or acts which are to be shunned. In anthropology, it embraces all prohibitions enforced by magico-religious sanctions, fortified by fear of ill-luck, disease, or death. The primal taboos were essentially totemic in nature and origin.

Taboo came to concern itself with other vital crises, especially childbirth and death, and when kingship and priesthood emerged it was utilised for protecting property and privilege. The violator of a taboo is himself taboo, lest his transgression should become contagious. The principle is encountered in Melanesia, Siberia, Madagascar—where it is called fady—and W. Africa. Linked in early Semitic society with religious sanctions, it became the basis of the Mosaic sanitary law. *See* Anthropology; Society; Totemism; *consult also* The Golden Bough, J. G. Frazer, 1907-15; Totem and Taboo, S. Freud, Eng. trans., 1919.

Tabor. Small drum associated in rustic music with the pipe (*q.v.*). It is usually about 6 or 7 ins. deep and about twice that in diameter. Hung on the performer's left wrist, it is struck with a small stick.

Tabor. A town of Czechoslovakia, in Bohemia. It is 65 m. by rly. S. of Prague on the main line to Vienna. In the Ring Platz is a statue of Zizka, on its W. side the gabled Rathaus (1521), and on its N. side one of the stone tables at which the Taborites used to partake of Communion in the open air. Pop. 14,251. *See* Hussites.

Tabor. Mt. of Galilee, the traditional scene of the Transfiguration (*q.v.*). It is 1,840 ft. high, about 6 m. E. of Nazareth, and is known as Jebel et Tor.

Tabora. Town in Tanganyika Territory. It is a junction on the rly. from Dar-es-Salaam, which lies 530 m. E.S.E., to Kigoma on Lake Tanganyika and Mwanza on Lake Victoria. It is an ancient Arab centre, and as the meeting place of seven roads was formerly a great place for caravan traffic. Tabora was an important German settlement before the First Great War, during which it was taken by Belgian troops, Sept. 19, 1916. Pop. approx. 30,000.

Taborites. Extreme section of the Hussites, who were opposed to the Calixtines or moderate section. *See* Bohemia; Bohemian Brethren; Calixtines; Hussites.

Tabouis, GENEVIÈVE. French journalist.

Daughter of the painter Le Quesne, she was educated at the convent of the Assumption, the faculty of letters, Paris, and the archaeological school of the Louvre. In 1916 she married Robert Tabouis, and after the First Great War became a journalist specialising in international politics. In 1924 she was League of Nations correspondent of La Petite Gironde and Le Petit Marseillais, and became chief diplomatic correspondent of these papers and of L'Oeuvre in 1932. Her outspoken comments on the emergence of the Nazis attracted international attention, and upon the defeat of France in 1940 she went to the U.S.A. She wrote mainly on international affairs, but three early historical works were awarded prizes by the French academy.

Tabriz. City of Persia, capital of the province of Azerbaijan. Said to have been built by the wife of Haroun al Raschid in 791, it lies about 350 m. N.W. of Teheran, is a commercial centre, and exports raisins, cotton, the locally made carpets, and matches. Shortly before the First Great War it was connected by rly. with Caucasus, and thus linked with the Russian rly. systems. Its chief building is a fine Persian

mosque, and there is an appeal court. Pop. 214,000.

During the Persian revolution of 1909 the royalists besieged Tabriz for several months, but it was relieved by a Russian force, who occupied the city until the beginning of the Caucasus campaign in 1914. The Turks seized it in Jan., 1915, but evacuated it at the close of the month. Abandoned by the Russians early in 1918, it was again seized by the Turks. In 1922 it fell to Persian insurgents aided by Caucasian Bolsheviks, soon to be recovered by Persian troops. In the Second Great War, Russian troops crossed the Persian frontier Aug. 25, 1941, and occupied Tabriz next day, remaining there until May, 1946. During the revolt of 1945 in Azerbaijan the insurgents seized Tabriz Dec. 15, and held it until govt. troops re-entered the city Dec. 13, 1946. *See* Persia.

Tacanas. Group of S. American Indian tribes on the Madre de Dios river, Bolivia. Their dialects are derived from the Panos (*q.v.*), although they represent a lower culture.

Taché, ALEXANDRE ANTONIN (1823-94). Canadian missionary. Educated at Quebec and Montreal,

he became a missionary of the Oblate Fathers and did valuable work among the Indians of the North-West and the Great Lakes. He was enthroned bishop of S. Boniface, Manitoba, in 1853, the see being raised to archiepiscopal rank in 1871. Taché described his experiences in the N.W. in *Esquisse sur le Nord-Ouest de l'Amerique*, 1869.

Táchira. State of Venezuela. It lies S.W. of Mérida, S. of Zulia, and borders on Colombia. It produces coffee, cocoa, sugar, rice, tobacco, and vanilla. Silver, copper, iron, and coal are mined. San Cristóbal is the capital. Area, 4,284 sq. m. Pop. 245,722.

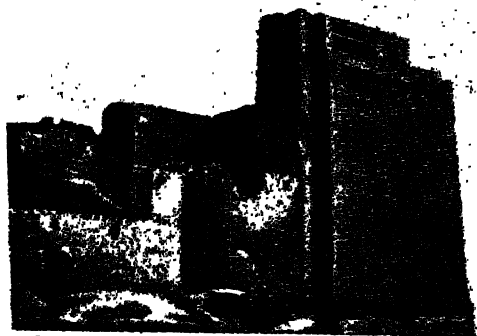
Tachometer (Gr. *tachos*, speed; *metron*, measure). Instrument for registering small variations in the velocities of machines. One such instrument consists of a mercury tube and bulb which is whirled round by the machine. Centrifugal action causes the recession of the mercury in the tube, and the degree of its descent (or ascent) measures variations in the running speed.



Mme. Tabouis,
French journalist



Alexandre Taché,
Canadian missionary



Tabriz, Persia. The ancient citadel, known as the Ark, which commands the city from the south-west

For measuring the angular speed of a revolving shaft there is a device similar to a small Watt governor. The spindle of the governor is horizontal and driven by the shaft. As the weights fly out, their movements are resisted by a spring, and the resistance is read by means of a moving needle round a graduated dial. A speedometer (*q.v.*) is a variety of tachometer.

In the vibrating reed tachometer there is a series of calibrated steel reeds of different lengths having one of their ends fixed in a brass block. When the instrument is subjected to the vibration of a machine one or more reeds show a visible response.

Tachycardia. Excessive rapidity of the heart's action. It may be of nervous origin or occur in the course of organic disease of the heart. *See* Heart; Neurosis.

Tachylite (Gr. *tachys*, swift; *lyein*, to dissolve). In geology, name given to glassy, basic igneous rocks of basaltic composition. Usually black or very dark in colour, they are generally vesicular and brittle. Tachylites are basalts that have been rapidly cooled and so chilled to form natural glass; and are common in most regions where volcanoes are found. *See* Basalt; Palagonite; Tuff.

Tacitus, CORNELIUS (c. A.D. 55–c. 119). Roman historian. He was of good family, and, adopting a legal career, passed through the usual offices of state. In 88 he acted as praetor. His first work was a dialogue on oratory written when quite young. When he was about 40 appeared the *Agricola* and the *Germania*. The former deals with the life of his father-in-law, *Agricola*. The *Germania* gives the first detailed account of the manners and customs of the people who inhabited central Europe in the beginning of the Christian era.

But the great work of Tacitus was his history of the Roman Empire from the accession of Tiberius. Though destined to form a homogeneous work, it was not written consecutively; the earlier portions, written last, are called *Annals*; the later, *Histories*. Unfortunately, of the 30 books written by Tacitus only about half have been preserved, but sufficient to give us the author's views concerning the emperors Tiberius, Claudius, Nero, and the events of 69, when three emperors occupied the throne in the course of a year.

To Tacitus, a stern republican, more than any other Roman writer is due the long-standing belief that

the early empire was a mass of iniquity and corruption, both public and private. Researches of modern investigators have found abundant evidence of good government and contented people existing in Rome. Tacitus, whose style is proverbial for brevity, was translated by A. J. Church and W. J. Brodribb, 1864–77.

Tacitus, MARCUS CLAUDIUS (d. 276). Roman emperor from Sept., 275, to April, 276. A man of wealth, aristocratic descent, and unblemished character, he was consul in 273, and at the age of 70 was chosen emperor by the senate, after the murder of Aurelian. During his short reign he endeavoured to restore the power of the senate, and to check extravagance by means of sumptuary laws. He defeated the Goths, who had invaded Asia Minor, but fell victim to a conspiracy. Probus succeeded him.

Tack. Nautical term for manoeuvring a vessel against the wind by changing her course from one direction to another. When tacking, a vessel is said to be making a board, or a leg, as she goes on a straight line in either direction. Tacking may also be described as beating against the wind, as the manoeuvre is resorted to only when the wind is blowing from the direction in which the vessel is going. There are only two tacks—port and starboard.

Tacking. In British parliamentary procedure, the addition of extraneous clauses to a money bill, in order to get them passed into law. The practice became frequent after 1678, when the house of commons established its sole right to introduce and alter money bills, leaving to the lords the mere power of rejection. *See* Parliament.

Tackle. General name for the combination of rope and blocks on board ship. Tackles generally

are called from the particular us to which they are put, *e.g.* stay tackles, yard tackles, gun tackles. *See* Rigging; Ship.

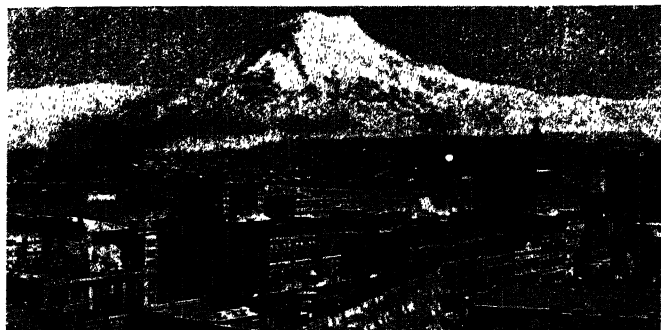
Tacloban. Capital of Leyte, in the Philippine Islands. It lies in the N.E. of the island on San Juanico Strait, which separates Leyte from Samar. It has an active trade, especially with Manila 340 m. distant, exporting in particular rice. In Japanese hands from their conquest of the Philippines, 1941–42, it was the point at which U.S. forces made their first landing in those islands, Oct. 20, 1944, Gen. MacArthur (*q.v.*) following his troops immediately and proclaiming from the steps of the govt. building there that he had come back to liberate the Philippines. The landing took the Japanese completely by surprise, and Tacloban was reoccupied virtually without opposition, the airfield near by being taken Oct. 21. A monument marks the spot where MacArthur landed. Pop. est. 12,000.

Tacna. Town of Peru, capital of the department of the same name. Sometimes called San Pedro de Tacna, it is on the Tacna river, 39 m. by rly. N. of Arica in Chile. Near it, in 1880, a Chilean army defeated the joint forces of Peru and Bolivia. Pop. 17,000.

Tacna and the neighbouring province of Arica (*q.v.*) were long in dispute between Chile and Peru. The problem was settled in 1929.

Tacoma. Summit of the Cascade Range, Washington, U.S.A., better known as Mount Rainier. *See* Rainier, Mount.

Tacoma. City of Washington state, U.S.A., capital of Pierce co. It stands at the head of Commencement Bay, a branch of Puget Sound, 27 m. S. of Seattle, and is served by the Northern Pacific and other rlys., and by ocean-going steamers. This busy Pacific port carries on a flourishing wholesale



Tacoma, U.S.A. View of this Pacific seaport, looking S.E. across the tidal flats at the head of Commencement Bay towards Mt. Rainier

trade. The city's prosperity dates from its selection in 1873 as the W. terminus of the N.P.R., and increased when it became the out-fitting base for the Klondike gold rush 20 years later. Founded in 1868, under the name of Commencement City, Tacoma became a town 1874, a city 1883. Pop. 109,408.

Taconic Mountains. Range of the U.S.A., also called Taghkanic Mountains. It extends along the borders of Massachusetts and Vermont, penetrating into Vermont, in which state it attains its maximum alt., Mt. Equinox, 3,816 ft. It gives its name to the Taconic period of mountain-building known to geologists.

Tacora. Volcano of Chile, near the Bolivian boundary. It rises to 19,500 ft. in the prov., and about 50 m. E.N.E., of Tacna: the rly. from Arica to La Paz passes E. of it through Villa Tacora, and over the Tacora Pass.

Tacsonia. Former name for a genus of climbing shrubs of the family Passifloraceae, natives of tropical America, now included in the genus *Passiflora*. The chief difference is found in the greater length of the calyx tube in *Tacsonia*. See *Passifloraceae*.

Tactical Air Force. Operational organization of the R.A.F. established in the Second Great War. Developed by Air Vice Marshal (later Lord) Tedder from the army cooperation group of Fighter Command, its function was to work in liaison with the army. Aircraft and personnel remained under R.A.F. control, but targets were specified by the army and advanced airfields moved up with the forward troops; this was made possible by the development of the prefabricated airstrip. The force had squadrons of light bombers, fighter-bombers, and aircraft armed with rocket guns for attacking armoured vehicles.

The 1st Tactical Air Force, modelled on the lines of the Desert Air Force, was formed shortly before the battle of Alamein, and provided air cover for the army in the advance through Africa, Sicily, and Italy. The 2nd was set up in Great Britain for the invasion of Europe, but before the actual assault it carried out important operations against enemy targets in occupied Europe. On Feb. 18, 1944, a Mosquito wing attacked from roof-top level Amiens prison, enabling hundreds of French partisans to escape. It provided the spearhead of the attack on D-day, and was largely responsible for heavy German

losses in armour throughout the following campaign. At the end of the war in Europe it became responsible for disarming the Luftwaffe. A 3rd Tactical Air Force operated in Burma with the 14th army.

Tactics (Gr. *taktikos*, arrangement). Military term to describe the art of executing an operation after the strategists have brought the opposing fleets or armies within striking distance of each other. Unlike strategy (*q.v.*), which is fixed and explains why a specific operation is feasible, tactics are fluid and may be varied as necessary when the opposing forces are in contact. Again, strategy is confined to operations which are tactically possible, whereas tactics may be opportunist and achieve victory in circumstances considered strategically impossible.

Broadly, the science of tactics consists in the arranging of combinations, the grouping, movements, and methods of employing armies, fleets, or air forces before and during battle. Tactics are mainly a matter of contact; after the line of battle has been drawn up, all operations are tactical until victory has been achieved or defeat sustained, but merge into strategy until this again provides the opportunity for conflict.

Major tactics are concerned with the movement into and employment in battle of large units, *e.g.* corps and divisions; minor tactics concern the operation of smaller bodies, *e.g.* a battalion of infantry. Below these heads come march tactics, supply tactics (or logistics), communication tactics, and combat tactics. These last include disposition of forces, securing controlling positions, utilising cover, retaining reserves, and initiating flanking movements (a typical piece of opportunist tactics).

Whereas strategy is constant, tactics are modified by new weapons and methods of defence. Every improvement in weapon power has altered tactics by decreasing the danger on one side and increasing it on the other; but every improvement in weapons has eventually been met by an improvement in defence which renders the improved weapon less lethal and no longer dominant. Fundamentally, therefore, tactics has always posed the same problem: to range a given number of troops, fighting vehicles, aircraft, or ships in such a manner that they may move and act with the maximum impact upon the enemy.

In battle the main design is to bring the opposing infantrymen into physical contact; the method alters, but the principle remains the same. Thus infantry tactics were altered by the introduction of the bayonet, which enabled infantrymen to combine the functions of musketeer and pikeman. In the First Great War, trench warfare developed the barrage fire to cover advancing infantry; smoke concealed flanking movements; greater fire power was developed by machine-guns. But trench warfare was merely a phase; the fundamental tactical object, defeat of the enemy by physical contact, was achieved only in open warfare. When aircraft and armoured vehicles were developed, thin infantry lines became powerless, but the tactical use of the infantryman in his primary rôle was restored by putting him in mechanised transport and protecting him with close support artillery. The threat of aircraft was reduced by camouflage and dispersal.

To be tactically successful, an army or navy must ensure close cooperation of all arms; one particular arm may be decisive, but only if used as part of a plan embracing all types of weapons. Before the Second Great War some tacticians had developed a theory of absolute warfare in which the bombing aeroplane was considered so dominant and decisive that it must render all other weapons obsolete. Germany rejected this theory, and her close tactical combination of land and air forces was proved correct in her invasions of the Netherlands, France, and Yugoslavia. On the other hand, the Allies' failure to appreciate the tactical union of armies and air power was a major factor contributing to their early disasters. Even when the Allies had developed overwhelming air power and initiated strategical bombing of Germany, they were unable to defeat her without destroying her armies in land fighting.

Basically, naval tactics differ little from those of land warfare. Their object is to bring warships in contact, and their method is mainly a matter of manoeuvring to place the enemy at a disadvantage. The tactics of a modern fleet action approximate to those of the galley period, for steam power, like manual power, makes possible any set combination of ships, and also the keeping of position with reasonable precision. After action has been joined, the

golden rule of naval tactics is to make the minimum changes of formation, so denying the enemy openings for opportunist tactics. Until the Second Great War tactics of supply played a minor rôle in naval warfare, as large forces of ships seldom fought major actions far from base. But during the war against Japan, the vast distances of the Pacific made tactics of supply of supreme importance and led to the establishment of the fleet train.

Conversely, the tactics of air fighting are nearly always opportunist, particularly when aircraft are operating with land forces. In general, the fighter, fighter-bomber, and ground attack aircraft are tactical weapons, and the heavy bomber strategic. *See* Air Fighting; Tactical Air Force.

David Le Roi

Tacuarembó. Dept. of N. Uruguay. It has an area of 8,112 sq. m., and is bounded S. by the Rio Negro. Good pasture lands provide sustenance for large herds of cattle. The city of Tacuarembó is the capital. Pop. 105,939.

Tadcaster. Town of Yorkshire (W.R.), England. It stands on both sides of the Wharfe, 9 m. S.W. of York, with a rly. station. The chief building is S. Mary's church, rebuilt in the 19th century. For centuries the town has been famous for its beer; another industry is the quarrying of limestone. Built on the site of the Roman Calcaria, Tadcaster had a castle and was an im-

portant place in the Middle Ages. About 2 m. away is the battlefield of Towton (q.v.). Pop. 3,687.

Tadmor. Ancient city of Syria. Its site, 150 m. N.E. of Damascus, is marked by an Arab village still called Tadmur. The city mentioned in 1 Kings 9, as founded by Solomon, so named in the A.V., and corrected to Tamar in the R.V., may have been in South Palestine.

Tadmor was an Aramaean caravan station between the Persian Gulf and the Mediterranean, and became important during the old Persian kingdom, when its Semitic population handled the luxury trade with the West in Asiatic products. The decay of the Nabataean route through Petra about A.D. 100 greatly increased

the opulence of Tadmor, the Greek name of which was Palmyra. The city furnished auxiliary soldiers to the Roman army. *See* Palmyra.

Tadpole (Eng. *toad-poll*). Popular name for the larval stage of the frog and toad. *See* Frog.

Tadzhik. People of Afghanistan and adjacent areas of the U.S.S.R. They are held to be the survivors of the original possessors of the soil, and speak a form of Persian. Most of them are agriculturists, and in Afghanistan they are organized in village communities under headmen. For the most part Sunnites, they are round-headed people of a primitive type.

Tadzhik OR TADZHIKISTAN. Constituent republic of the U.S.S.R. Situated N. of the Oxus, it is bordered by Uzbek S.S.R. and Kirghiz S.S.R. in the W. and N.; by Chinese Turkistan in the E., and by Afghanistan in the S. It covers 55,700 sq. m., and includes the Badakhshansk-Gorno autonomous region. The capital is Stalinabad (q.v.), formerly Dushambe. Much of the republic comes within the region of the Pamir Mts., the highest points being Stalin Peak (24,600 ft.), and Lenin Peak

other minerals. A rly. connects Stalinabad and Termez, and there are steamer services on the Oxus. Many good roads have also been constructed. About three-quarters of the pop. of 1,485,900 are Tadzhiks (r.s.), the remainder being mostly Uzbeks. The republic, which was originally made up of the regions of Bukhara and Turkistan where the pop. was mainly Tadzhik, was admitted as a constituent republic of the U.S.S.R. in 1929. In 1940 a new alphabet based on the Russian was introduced into the schools.

Tael (Malay *tail*, a weight). Name for the Chinese liang or silver pound weight. It was formerly the uncoined monetary unit of China.

Taenia. Genus of tape worms. For the species which commonly infest the intestines of human beings, *see* Cestodes.

Taff. River of S. Wales. Rising in N.E. Pembrokeshire, it flows 25 m. S. and S.E. through Carmarthenshire to Carmarthen Bay.

Taff. River of S. Wales. Rising in the Brecknock Beacons, it flows 40 m. S.S.E. through Glamorgan-shire, passing Merthyr Tydfil, Pontypridd, and Llandaff, and entering the Bristol Channel at Cardiff. It traverses a coal and iron dist. and its course is followed by the old Taff Vale rly.

Taffeta OR TAFFETY (Pers. *tafta*, woven). Light, thin, glossy silken fabric. The name has been applied to many different materials—at one time to plain woven silks generally. Taffeta was apparently introduced into England in the 14th century. During part of the 16th century it was a thick and costly stuff. Towards the end of the 16th century and into the 17th it seems to have been a very soft, thin material. In the 18th century it was sometimes striped with gold and silver or was ornamented with check or floral designs. There are dress and furnishing taffetas.

Taffrail (Dutch *taferel*, from Lat. *tabula*, table). Name commonly given to the upper part of a ship's stern timbers. *See* Ship.

Taffrail. Pen-name of Henry Taprell Doring (b. 1883), British sailor and author. In 1897 he entered the navy as a cadet in H.M.S. Britannia, and served in South Africa and China, being at the siege of the Peking legations, 1900. Towards the end of the First Great War he was awarded the D.S.O. In 1942-45 he was on the staff of the Mediterranean c.-in-c. Among his books, mostly adven-



Tadcaster, Yorkshire. Parish church of S. Mary

(23,400 ft.). The huge mountain glaciers are the source of many fast-flowing rivers, tributaries of the Amu-Darya which flows along the S. border of the republic.

The chief occupation is agriculture, including cotton-growing. Much of the farm produce is grown on artificially irrigated land, the Hissar and Fergan canals being valuable in this connexion. Much fruit, including apricots, figs, oranges, pomegranates, and lemons, is grown. At the Tadzhik biological station (over 12,000 ft. above sea-level) barley, oats, and wheat have been grown. The mountainous regions have deposits of lead, zinc, arsenic, bismuth, radium, and uranium. In other parts of the republic are mica, emery, corundum, sulphur, and

ture stories of the sea, are Pincher Martin, O.D., 1916; H.M.S. Anonymous, 1919; Pirates, and Men O'War, both 1929; The Man from Scapa Flow, 1933; Swept Channels, 1935; Chenies, 1943. Under his own name Dorling wrote a standard work on Ribbons and Medals, new ed. 1947.

Taff Vale Judgement. Name usually given to a decision of the house of lords in 1901. This decision made the funds of trade unions liable for acts committed by their members; e.g. the deterioration of goods held up owing to a strike might be considered the responsibility of the sponsoring trade union. (See Trade Unions.) The judgement was given when considering a dispute between the Taff Vale rly. co. and its employees. This co. controlled 112 m. of line, serving Merthyr and Cardiff, and places in the great industrial area around them, and owned docks at Cardiff and Penarth; it was later incorporated in the G.W.R.

Taffy. Popular name for a Welshman. It is a corruption, from the Welsh pronunciation, of Dafydd or David, the patron saint of Wales.

Taflelt OR **TAFILET.** Oasis of Africa. It comprises a number of separate oases and contains about 300 fortified villages. Situated S.E. of the Atlas Mountains in S.E. Morocco, about 10 days' journey from Fez, it is celebrated for its dates, and was first visited by René Caillie in 1828. Taflelt is the cradle of the reigning dynasty in Morocco. The chief centre of population is Abnam or Bu Am, whence a caravan route runs S. across the Sahara to Timbuktu. Taflelt was occupied by the French in 1916, the native army, about 8,000 strong, being defeated on Nov. 16.

Taft, ROBERT ALPHONSO (b. 1889). American politician. He was born at Cincinnati, Sept. 8, 1889, the son of W. H. Taft (v.i.). He graduated from Yale in 1910 and received a law degree at Harvard in 1913. During the First Great War he served as an assistant counsel in the U.S. food ministry, and in 1921 was elected member of the Ohio house of representatives, becoming U.S. senator in 1939. In 1940 and 1944 he was strongly supported as Republican candidate for the presidency, but did not secure nomination, though he became accepted leader of his party in the senate. An avowed isolationist in foreign affairs, Taft also advocated restricting the power of trade

unions, the passing of the Taft-Hartley Labour Act of 1947, directed against the "closed shop" being largely due to his influence.

Taft, WILLIAM HOWARD (1857-1930). American statesman. Born at Cincinnati, Ohio, Sept. 15, 1857, he studied at Yale and the Cincinnati law school, and after a brief period as a legal journalist, practised law in his native state. Judge of the superior court of Ohio, 1887-90, he then became U.S. solicitor-general. As a judge of appeal, 1892-1900, he made a great reputation by his business and political decisions, and his ability was further proved in the Philippines, where he was sent to institute civil government and introduce some degree of order, 1900-04. On his return Taft became secretary of war in Theodore Roosevelt's cabinet, in which capacity he travelled widely. Elected president of the U.S.A., 1908, by a large majority, his term of office was unmarked by any striking events, but his tariff acts of 1910 were unpopular, and the united votes for Roosevelt and Wilson brought about his defeat in the election of 1912. On his retirement Taft became professor of law at Yale. In 1921 he was appointed chief justice of the U.S.A., resigning in Jan., 1930. He died March 8, 1930. A Life by F. C. Hicks appeared in 1946.

Taganrog. Russian seaport, in the Azov-Black Sea area of the R.S.F.S.R. It is on the N. shore of the Gulf of Taganrog, which leads out of the Sea of Azov, and is connected by rly. with Rostov 40 m. to the E. There are three harbours, but they have partly silted up, and trade has been further lost to the rising Rostov. Taganrog is icebound in winter. The exports are grain, butter, linseed, tallow, and caviare; there is some fishing, and manufactures include metal goods, leather goods, and footwear. Russia annexed Taganrog in 1769; it was partly destroyed by Anglo-French bombardment in 1855. During the Second Great War the Russians admitted, Oct. 22, 1941, its evacuation after many days of stubborn fighting. It was recaptured Aug. 30, 1943, a breakthrough by Russian cavalry and tanks behind the city having isolated the Ger-



William H. Taft, American statesman

man garrison, whose rly. communications with the Donetz had already been cut. This victory cleared the Germans from the Rostov Region. A Chekhov museum is maintained, for the dramatist was born here. Pop. 188,808.

Tagliacozzo, BATTLE OF. Victory of Charles I of Naples and Sicily over the imperial army commanded by Conradin, Aug. 23, 1268. After the death of Manfred, imperial nominee to the throne of Sicily, and the assumption by Charles of the crowns of Sicily and Naples, Conradin, the last of the Hohenstaufens and grandson of the emperor Frederick II, invaded Italy, and with a mixed army of Germans, Italians, and Saracens marched S. About 1 m. N. of Tagliacozzo, a village in the Sabine Hills, some 57 m. E. of Rome, he was met by Charles and defeated. Conradin was captured, and executed at Naples, Oct. 29, 1268.

Tagliamento. River of N.E. Italy, in Venetia. It rises in the Carnic Alps and flows S. across Udine to the Gulf of Venice, Adriatic Sea, after a course of 100 m. Heavy fighting took place along the line of the Tagliamento in the First Great War. After the Italian reverse at Caporetto, the armies retreated to the river, where they stood from Oct. 28 to Nov. 5, 1917, before continuing their retreat to the Piave. The Allies reached the Tagliamento in their advance in Oct., 1918. See Caporetto; Italy; Piave. *Pron.* Tahl-yamento.

Taglioni, MARIA (1804-84). Italian dancer. Born at Stockholm, April 23, 1804, daughter of a



Maria Taglioni, Italian dancer

ballet master, she made her first appearance in Vienna at 18. In 1827 she appeared in Paris and immediately attained enormous popularity, for the next twenty years being the most famous ballet dancer in Europe. Her greatest success was in her father's ballet *La Sylphide*. She retired in 1847, and died in poverty, April 23, 1884. Her life was written by A. Levinson, Eng. trans. 1930. *Pron.* Tahl-yohne.

Tagore, ABANINDRA NATH (b. 1871). Indian artist. Born at Calcutta, and educated at the Sanskrit College there, he became vice-principal of the government school of art, Calcutta, in 1905,

later being appointed professor of fine art at Calcutta university. His own artistic output was largely in connexion with ceremonial decorations and designs, especially noteworthy being a memorial address presented to Lady Curzon during her husband's viceroyalty. But he also illustrated in colour Rabindranath Tagore's *The Crescent Moon* and *Sister Nivedita's Myths and Legends of India*.

Tagore, SIR RABINDRANATH (1861-1941). Indian writer. Of a family distinguished in religion,



Rabindranath Tagore,
Indian writer

letters, and art, he was born in Calcutta, May 6, 1861. Educated at Calcutta and in Europe, he became known as a writer of Bengali verse. In 1901 he founded a reformed school at Bolpur. Awarded the Nobel prize for literature, he was knighted in 1915. He died Aug. 7, 1941.

He wrote many poems, dramas, and novels in Bengali and English, including *Gitanjali* (*Song Offerings*), 1913; *The Crescent Moon*, 1913; *The King of the Dark Chamber*, 1914; *The Post Office*, 1914; *Home and the World*, 1919. He also wrote *My Reminiscences*, 1917; and *Nationalism*, 1917; *The Religion of Man*, 1931. To a profound religious consciousness Tagore united active sympathy with humanity and a fresh and intimate feeling for nature. His poetry expressed a pure and lofty mysticism in language of simple and serene dignity. *Consult*

Lives, R. Sastri, 1917; E. J. Thompson, 1930; V. Lesny, 1939.

Tagus (Span. *Tajo*; Port. *Tejo*). Longest river in the Iberian peninsula. It rises in Spain in the Sierra de Albarracin, curves to the N.W., then flows W.S.W. past Toledo and Alcántara, forms for a few m. the boundary of Spain, and finally crosses Portugal to its estuary near Lisbon after a course of 565 m., of which 192 m. are in Portugal. It is tidal, and navigable by large vessels to Santarém; rapids interfere with navigation in Spain. The chief affluents are the Jarama, Alberche, Tietar, Alagon, and Zezere, all on the right bank.

Taharka or **TIRHAKAH** (c. 722-663 B.C.). Ethiopian king of Napata. As viceroy of Lower Egypt he rendered some support to Hezekiah during the siege of Jerusalem

in 701 by Sennacherib (2 Kings 19; Isaiah 37), and succeeded Shabataka as sole king about 691.

Tahiti or **OTAHEITE**. Largest of the Society Islands, a French possession in the South Seas. The two unequal circular mountainous portions joined by a narrow isthmus have an area of 600 sq. m. The highest of many extinct volcanoes rises to 7,688 ft. The slopes are scored by ravines and valleys, and the low coastland consists of volcanic detritus mixed with coral sands from the encircling reefs. Rainfall is abundant, vegetation luxuriant, but only a small area is cultivated. Tropical fruits and the sugar cane grow; pearls, copra, rum, and phosphates are exported. Papeete, the seat of administration of the French colony, is the chief town. It was shelled and damaged by German cruisers in 1914. In the Second Great War Tahiti supported Free France. A plebiscite in Tahiti, the neighbouring Moorea, and the Tuamotu Group gave 5,564 votes for Gen. de Gaulle, 18 for Vichy. Pop. 23,133. *See* Society Islands.

Tahiti Apple (*Spondias dulcis*). Tree of the family Anacardiaceae. It is a native of the Society, Friendly, and Fiji Islands. The leaves are divided into elliptic leaflets arranged featherwise, with rounded teeth. There are clustered, small, yellow-green flowers. The edible fruit, with the flavour of pineapple, is like a large plum, of a



Tahiti Apple. Spray of flowers and foliage of the South Pacific fruit tree. Inset, fruit

golden yellow colour, containing a stone covered with hooked bristles.

Tahpanhes. Ancient fortress at Tell Defneh, 10 m. W. of Kantara, Lower Egypt. The Greek *Daphnae*, founded by Psammetichus I, 664 B.C., for defending the Asiatic frontier, its Greco-Egyptian jewelry trade flourished until transferred to Naucratis. In 1886 Petrie excavated its

brick fort, still called the castle of the Jew's daughter.

Taiga. Sub-arctic or northern coniferous forest, which spreads almost without interruption across



Tahiti. Man and girl of the Polynesian aborigines who inhabit the Society Islands

the N. of N. America, Europe, Asia. It lies S. of the tundra (*q.v.*), and is one of the most widespread types of natural vegetation in the world. The chief trees are pines, fir, spruce, and larch. Forests of the taiga type are also found in mountainous regions immediately below the upper tree limit.

Taihoku. Japanese name for the capital of Formosa. *See* Taipei.

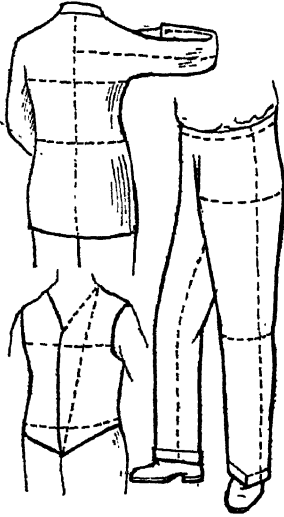
Tai-hu. Lake of China, in the prov. of Kiangsu. It is 150 m. in circumference, and is dotted with islands on which are temples and villas of the merchants of Hangchow. It is connected with the Grand Canal at Suchow, and is one of the beauty spots of Central China. Many famous poems are still recited and sung, celebrating the glories of the lake.

Tai-kyu. Town of Korea, capital of the dist. of N. Keisho. Situated 190 m. by rly. S.E. of Seoul, and surrounded by ruined walls, it trades in fruit, tobacco, and cereals. Pop. 68,770.

Tail. Prolongation of the backbone in vertebrate animals. It is a portion of the body containing no viscera, but consisting solely of bone and muscle. Tails are organs of locomotion in fishes, serve as grasping organs in monkeys, are weapons of defence in porcupines, and serve as balancers in leaping animals, as kangaroos. *See* Animal.

Taille. Tax levied in France before the Revolution. It was levied by the king in those provinces that were *pays d'élection*, but not in the *pays d'état*. The taille was in the nature of an income-tax. See *Taillage*.

Taillefer (d. 1066). Norman jongleur, who accompanied William the Conqueror to England, and fell at the battle of Hastings. Tra-



Tailoring. Diagram showing the measurements necessary for cutting out men's clothing.

dition says that he asked for the honour of striking the first blow, and went forth singing of the deeds of Charlemagne, and performing juggling feats. He figures in the Bayeux tapestry. See *Jongleur*.

Tailoring (Fr. *tailleur*, to cut). The process of making clothes. In spite of the derivation, tailoring and cutting have become two distinct operations. The present-day cutter designs a garment, measures a customer, cuts the cloth, and fits the coat or suit. The tailor stitches the cloth together into the finished article. Cutters and tailors usually specialise in their own branch of the trade, although knowledge of both branches makes for efficiency.

Entry into the tailoring trade formerly demanded an apprenticeship of several years (though a man could qualify as an inexperienced cutter after a course at one of the

cutting schools recognized by the trade), but, after the Second Great War, when labour was badly needed, several plans allowed for, and encouraged, entry by means of learnership in a shop or by especially planned courses.

It was following the disappearance of the feudal system that the tailor as we know him began to appear. He was originally a bonded man making clothes only for his overlord, but as this system disappeared travelling tailors began to be seen offering their services for little more than their keep. Eating and living with the family, their wages might amount to half-a-crown per day, plus board and lodging. But with the advent of the industrial age and the increase of urban populations a new class of customers made its appearance. With the introduction of the sewing machine, some employers were quick to take advantage of mass production possibilities. Sweating was rife, and the dingy, unhygienic workrooms into which tradesmen and their women crowded to earn a meagre living were typical of the worse side of commerce after the industrial revolution.

At first, the coming of the sewing machine was not accepted favourably. Employers scoffed at it and employees were against it, thinking that its success would mean a great cheapening of labour. The trade went through a painful period of sweating. However, at the end of the 19th and the beginning of the 20th centuries, nationwide insistence that certain trades should be scrutinised brought reforms. Amendments to the Factories and Public Health Acts, the establishment of wages boards,

world's tailors, and England led the way in men's clothes both for style and quality of material.

John Taylor

Tailor Bird (*Orthotomus sutorius*). Species of Asiatic bird, belonging to the Sylviidae. It de-



Tailor Bird of Eastern Asia, which sews leaves together to form its nest

rives its name from its method of nest building. Two large leaves are drawn together, and sewn at the edges with cocoon silk or vegetable fibres; inside the pocket thus formed the birds construct a nest of grass and hair. The birds are common in India and China, are about 6 ins. long, and have greenish plumage.

Taimyr. The most N. peninsula of Asia. In the extreme end of the Krasnoyarsk region of Siberia, R.S.F.S.R., it lies between the mouth of the Yenisei and the Gulf of Khatanga, and terminates in Cape Chelyuskin.

Tain. Royal and mun. burgh and seaport of Ross and Cromarty, Scotland. It stands near the S. side of Dornoch Firth, 44 m. N. by E. of Inverness and has a rly. station. The chief building is the collegiate church of S. Duthus, a Decorated building founded in 1471



Tain borough arms

and restored in the 19th century. There are ruins of a chapel, and the burgh has a town hall, court house, and academy. The market town for an extensive district, Tain also has a distilling industry. The name Tain comes from the Icelandic word *thing*, meaning a court or assembly. Market days, Tues. and Fri. Pop. 1,551.

Tainan OR TAI-WAN. Town of Formosa. It stands near the S.W. coast, a few miles S.E. of Anping, its port, and is connected by rly. with the capital, Taipei, in the N. of the island. The chief town of the Dutch in the 17th century, it has remains of Dutch buildings. There is secure anchorage at Anping, except during the S.W. monsoon. In early history Tainan was the seat



Tain, Ross and Cromarty. The ancient church of S. Duthus

and the passing of the Trades Boards Acts were all instrumental in general improvements. Eventually London's Savile Row became the accepted headquarters of the

of govt. of the island; it gives its name to a prov. Pop. 181,982.

Taine, Hippolyte Adolphe (1828-93). French historian and critic. Born at Vouziers, Ardennes.



Hippolyte Taine,
French historian
After Bonnat

April 21, 1828, and educated in Paris, he early won distinction by his doctor's thesis on La Fontaine, later amplified into a volume entitled *La Fontaine et ses*

Fables, 1853, and a prize essay on Livy. For some years his religious opinions debarred him from an academic career, and he occupied himself with independent work, e.g. *Les Philosophes du XIXe Siècle*, 1856, and *Histoire de la Littérature Anglaise, 1863-64* (Eng. trans. by Van Laun, 1872-74); but in 1864 he was appointed professor of aesthetics in the *École des Beaux Arts*, four volumes on *La Philosophie de l'Art* being a direct result of his academic lectures. He then returned to philosophy, and in his treatise *De l'Intelligence*, 1870, made a noteworthy contribution to the scientific study of mind.

Taine's last twenty years were devoted mainly to a series of works on *Les Origines de la France Contemporaine* (*L'Ancien Régime*, 1875; *La Révolution*, 1878-85; *Le Régime Moderne*, 1890-94—the last unfinished). These panoramic studies of the process and the evils of centralisation in France, by their solidity of learning, impartiality of judgement, and energy of style give Taine a high place among historians. He became a member of the Academy in 1878, and died March 5, 1893.

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Taipei. Capital city of the island prov. of China called Formosa or Taiwan. It is about one hour's journey by rly. from Kilung, at the N. extremity of the island, in the midst of beautiful scenery. Taipei proper is the ancient walled city, as distinct from that section known as Twatutia which was occupied by European settlers. Nowadays, however, the city and environs are together known as Taipei. The river Tamsuiyei encircles part and adds to the general attractive-

ness of the district. Camphor works occupy most of the employed. From 1895, when the island was ceded by China to Japan, the capital was called Taihoku, and became the h.q. of Japanese administration until the end of the Second Great War, during the latter stages of which it was frequently bombed from the air by the Allies. Pop. 340,114.

Taiping Rebellion. Civil war which raged intermittently in China 1850-64. By 1853 all S. China was in the hands of the usurper, Hung Siu-tsuan, who in Nanking, the old capital, had proclaimed himself first emperor of the Taiping dynasty. Troubles with the British and the French prevented the reigning Manchu dynasty from exerting its full strength against the rebels, but in 1863 an imperial army was organized by Gordon, whom the British government lent to the Chinese. This force won victory after victory, earning for itself the title of Ever Victorious Army. By July, 1864, Nanking had been captured, and the rebellion was at an end, the Taiping usurper ending his life by suicide. See China; Gordon, C. G.

Tait, Archibald Campbell (1811-82). British prelate. Born in Edinburgh, Dec. 22, 1811, he was



Archibald Tait,
British prelate

educated at Glasgow university and Balliol College, Oxford, and was ordained in the Church of England in 1836. In 1842 Tait succeeded Arnold as headmaster of

Rugby; in 1849 he was made dean of Carlisle, and in 1856 bishop of London. From 1868 archbishop of Canterbury, he died Dec. 3, 1882. Tait did a great work in organizing the diocese of London, but at Canterbury he was less successful; he had to deal with cases of ritual and was criticised as over-emphasising the connexion of Church and state. Randall Davidson, a later archbishop, married Tait's daughter and wrote his life, published in 1891.

Tait, Peter Guthrie (1831-1901). Scottish physicist. Born at Dalkeith, April 28, 1831, and educated at Edinburgh university and Peterhouse, Cambridge, he was appointed professor of mathematics at Queen's College, Belfast, 1854, and of natural philosophy at Edinburgh, 1860, a post he held almost

until his death, July 4, 1901. In collaboration with Kelvin, then William Thomson, Tait produced the work which made him famous, *Natural Philosophy*. With Balfour Stewart he published anonymously *The Unseen Universe, or Physical Speculation on a Future State*, 1875, a book which caused much controversy. He made important contributions to thermodynamics, to the theory of the dissipation of energy, and to the kinetic theory of gases.

Taiwan. Japanese name for the island described in this Encyclopedia as Formosa.

Tai-Yuan. Capital of Shansi prov., China. Situated on the main high road from Peking to the W., at an alt. of 2,260 ft., it is connected by rly. with Shihchia-chuang, a station on the Peking-Hankow line. The circuit of the walls is 8 m., and the town contains 400 temples, together with a university and an arsenal. Tai-Yuan is in the centre of an important coal and iron area. Pop. 58,711.

Tajik. Constituent republic of the U.S.S.R. The alternative spelling Tadzshik is preferred in this Encyclopedia.

Taj Mahal. An Indo-Muslim mausoleum near Agra, in the Uttar union, India. It was completed in 1650 by the Mogul emperor, Shah Jehan, in memory of his favourite wife, Nour Mahal. The building is mainly constructed of white marble, and the massive tombs of the emperor and his consort are of the same material; over these rises a beautiful dome, flanked by similar domes, while there is a tall minaret at each of the four corners of the structure. This world-famous building occupied 20,000 workmen for over 20 years. See Agra.

Takamatsu. Town of Japan. Standing on the N. coast of Shikoku Island, 82 m. W. by S. of Osaka, it is the capital of Kagawa prefecture, and is the N. terminus of a rly. It exports lacquer goods, silks, cotton crapes, and matches.

Takin (*Budorcas taxicolor*). Large ruminant mammal, occupying a rather doubtful position between the goats and the antelopes. It seems to occur only in the N. of Assam, in Bhutan, and in N.W. China. It is a heavy and bulky



P. G. Tait,
Scottish physicist



Takin. Ruminant animal, large and heavily built, that wanders in herds among the Tibetan mountains

animal, about $3\frac{1}{2}$ ft. high at the shoulder, with very stout limbs, and thick black horns which curve at first outwards and then backwards. Takins occur in small herds in the mountains and are very difficult to stalk.

Taking Silk. Term applied colloquially to the appointment of a barrister as king's counsel. The phrase takes its origin from the silk gown worn by these barristers.

Taklamakan. W. region of the Gobi desert in Sinkiang. Situate between the Kwen-lun range and the Tarim curve, and bisected by the Khotan river, its 259,000 sq. m. are covered by arid sand-dunes, ranging up to 350 ft. It was visited by Marco Polo about 1273. Sven Hedin's explorations in 1896, at the sand-buried town of Taklamakan near the Keriya river, yielded many Greco-Buddhist remains. During 1907-08 Sir Aurel Stein traversed the desert from Kucha to Karadong.

Takoradi. Harbour of the Gold Coast. It is 3 m. W. of Sekondi and has rly. communication with the interior and with Accra. Planned in 1921, it was opened in 1928 as the only harbour of consequence on the coast of W. Africa between Dakar and Pointe Noire. Breakwaters, wharves, docks, and equipment to handle 5,000 tons a day cost about £4,000,000. When the Mediterranean route to Egypt was closed to Allied shipping in the Second Great War, Takoradi became a supply base for the Allied armies in Egypt and N. Africa; aircraft in crates were brought there by sea, assembled at an R.A.F. maintenance unit, and flown across Africa to Cairo.

Takow or TAKAO. Seaport on the S.W. coast of the island of Formosa. It is 22 m. by rly. S.

of Tainan. Opened to foreign trade in 1864, it has an export trade in sugar and rice, produced mainly by Chinese immigrants from Kwangtung, and in camphor. Pop. 21,865.

Taku. Village situated at the mouth of the Haiho (Peiho) in Hopei prov., China. Its forts formerly constituted a first line of defence for Tientsin, 47 m. up the river, and for Peking. They were taken by the British and French forces in 1858, in 1860, and during the Boxer Rising in 1900, when they were demolished. See Boxers; China; Peking. Taku is also the name of a small island off the Solomon Is., under Australian trusteeship.

Talaing. Name for the Mon people of Pegu, Burma, who acquired the culture of the Telingana coast of S. India, upon which all Burmese tradition is based.

Talamanca. American Indian tribes in S. Costa Rica and N. Panama. Extending along both slopes of the Talamanca and Chiriqui cordilleras, they include the Atlantic Tiribri and Bribri and the Pacific Boruca.

Talanti or ATALANTI. Channel in Greece, sometimes called the Gulf of Talanti or Atalanti. It flows between N.W. Euboea and the mainland, and is from 3 to 5 m. wide and 20 m. long. On its W. side is the town of Talanti, about 60 m. N.W. of Athens.

Talari. Former Ethiopian silver coin, also known as the Menelek dollar. Worth nominally about two shillings and first coined in 1894, it was divided into 16 silver piastres, and was coined in other fractional pieces. A new currency, the Ethiopian dollar of 100 cents, was introduced 1945.

Talavera DE LA REINA. Town of Spain, in the province of Toledo. The ancient Caesarobriga, it stands on the Tagus, at its confluence with the Alberche, 83 m. by rly. S.W. of Madrid. Parts of the ancient walls, a Roman gateway, a 10th century Moorish tower, and a Gothic church are of historical interest. A 15th century bridge of 35 arches spans the river. Silk weaving and manufacture of earthenware are the chief industries. Pop. 14,500.

Talavera, BATTLE OF. British victory in the Peninsular War,

July 27-28, 1809. Advancing from Portugal, Wellington had reached the Tagus and lined his forces along the hills which lie N. and W. of the town of Talavera. A Spanish army under Cuesta, composing two-thirds of his allied forces, held the town itself. Early in the morning of July 27 the French attacked the British, forcing back the line; after a violent bombardment the attack was renewed with a fury which threatened the allied armies with disaster. The situation was saved by the arrival of Gen. Hill, who regained the lost ground. The French renewed the assault at dawn next day, but were eventually repulsed by the fire of the British infantry and the cavalry charges. In the afternoon a counter-attack by Wellington decided the issue. The French, with losses of over 7,000, retired to Madrid, but the British, whose losses were heavier in proportion, were unable to pursue.

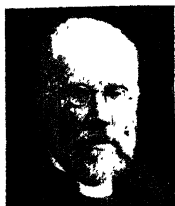
Talayot. Prehistoric round tower in the Balearic Islands. The typical form is of megalithic blocks, sometimes slightly hewn, in flat, unmortared courses sloping inwards. From the doorway a corridor leads to a round chamber, whose beehive vaulting is sometimes supported by one or more central pillars. The name is occasionally applied loosely to other prehistoric remains.

Talbot. Ancient name for a breed of dogs, apparently the extinct southern-hound, which was a variety of the existing bloodhound (*q.v.*). It is the badge of the Talbot family (earls of Shrewsbury), but whether the hound or the family first held the name is uncertain.

Talbot. Name of an ancient English family of Norman descent. The family proves descent from Richard Talbot, lord of Linton, Herefordshire, who was appointed custodian of Ludlow Castle by Richard I. The manor of Linton was confirmed by Edward III to Gilbert, who sat as Baron Talbot in the parliament of 1331. The head of the family under Henry V was Gilbert, a distinguished soldier, upon whose death the title descended to his brother John, first earl of Shrewsbury (*q.v.*), his descendants retaining it.

Talbot, EDWARD STUART (1844-1934). British prelate. Born Feb. 19, 1844, he was educated at Charterhouse and Christ Church, Oxford. Upon ordination he became the first warden of Keble College in 1870, going to Leeds as vicar in 1889.

In 1895 he was bishop of Rochester, in 1905 of Southwark, and of Winchester during 1911-23.



Edward S. Talbot,
British prelate

He wrote many books on religious questions; his memoirs were published in 1924. Talbot died Jan. 30, 1934. A Life, by G. Stephenson, appeared in 1936.

His son Gilbert (1891-1915), who was killed in action in the First Great War, gave his name to Talbot House, commonly called Toc H (*q.v.*), the original house being at Poperinghe.

Talbot, WILLIAM HENRY FOX (1800-77). British inventor. He was born Feb. 11, 1800, and educated at Harrow and Trinity College, Cambridge. A mathematician of distinction, he gave much time to scientific study, and in 1833 made the discovery on which photography (*q.v.*) ultimately rests, although he did not publish the fact until 1839. Improvements were made by him, and the process he invented is known as the calotype or talbotype. Also an archaeologist, he wrote *The Pencil of Nature* and other books. Talbot died Sept. 17, 1877.



W. H. Fox Talbot,
British inventor

Talc (Arab. *taly*). Hydrated magnesium silicate, $3\text{MgO} \cdot 4\text{SiO}_2 \cdot \text{H}_2\text{O}$. It is found as foliaceous or compact masses resulting from the hydration of magnesium-bearing rocks, such as peridotites, gabbros, dolomites, etc. Talc is extremely soft and greasy to the touch, varying from white to dark green. Varieties include steatite or soapstone (massive); pot-stone (impure massive); French chalk, a steatite used by tailors for marking cloth; indurated talc, an impure slaty variety. Talc is a filler for paper, rubber, paints, etc.; is used in powder for toilet and for the treatment of certain skin irritations; as an absorbent for nitroglycerine; in slabs for insulation or acid-resisting purposes; as an ingredient in soap; and is sometimes carved into ornaments.

Talca. Prov. and town of Central Chile. The prov. lies between Curico and Linares, the E. boundary being amid the Andes. It pro-

duces wheat and rears cattle. Its area is 3,721 sq. m. Pop. 157,141.

The town, capital of the prov., is on the river Claro, and is a rly. junction 140 m. S. of Santiago. Ponchos are manufactured here. The town was considerably damaged by earthquake, Jan. 24, 1939. Pop. 56,735.

Talcahuano. Seaport of Chile, in the prov. of Concepción. It is 9 m. by rly. N.W. of Concepción, of which it is the port. Founded in 1780, it has an excellent harbour with government dockyards and arsenals. There is considerable trade in wheat. In 1835 it was almost entirely destroyed by an earthquake and was again damaged by an earthquake in 1928, being completely rebuilt. It is now an important industrial city with a wide range of factories of many types. Pop. 41,536.

Talent (Gr. *talanton*, weight for measuring gold and silver). Unit of weight and monetary denomination used by many ancient countries. It was introduced by the Babylonians, and is frequently mentioned in the O.T. The Babylonian talent of weight, or common talent, was equivalent to 57½ lb. avdp., and the monetary unit, or royal talent, varied in value between 310 and 400 gold sovereigns. The Greek talent was normally of 10 p.c. less value than the Babylonian, but its worth varied with the supply of gold and silver. The great Roman talent was worth 100 gold sovereigns and the small one 75. Until the fall of the Roman empire, Babylonian, Assyrian, Hebrew, Greek, and Roman talents remained legal denominations. See *Shekel*.

Tale of a Tub, A. Prose satire by Swift. Written in 1696, it was first published anonymously in 1704. The satire, which is directed against church divisions, concerns three brothers and their inheritance—Peter (the Church of Rome), Martin (Luther), and Jack (Calvin). Remarkable for its witty presentation, its authorship undoubtedly prevented Swift's preferment to a bishopric. The same title was given by Jonson to one of his comedies in 1633.

Tale of Two Cities, A. Novel by Dickens, published in *All the Year Round*, April 30-Nov. 26, 1859, and concurrently in eight monthly parts, with engravings by Phiz (marking the end of the long collaboration between the author and this artist). The plot moves between Paris and London during the French Revolution, and the central character, Sydney Carton,

the dissipated barrister, who gives his life that Charles Darnay, his successful rival to the hand of Lucie Manette, may live, is one of the most moving of the novelist's creations. Watts Phillips's drama, *The Dead Heart*, with a similar plot, came out on Nov. 10, 1859. Dickens's novel was dramatised by Tom Taylor in 1860, and by Freeman Wills and F. Langbridge as *The Only Way* in 1899, Sir J. Martin-Harvey's Sydney Carton remaining for many years one of his most notable impersonations. See *Carton, S.*

Talesman. Person from among the bystanders in court (*tales de circumstantibus*) who may be required to serve on a jury in the event of there not being sufficient jurors present. In *The Pickwick Papers*, Sergeant Buzfuz prayed a *tales* to take the place of two special jurymen who were not present.

Tales of a Grandfather. Stories on Scottish and French history, written by Scott for his grandson, John Hugh Lockhart (d. 1831). The four series were published, 1828-30. Inspired by J. W. Croker's *Stories for Children* from English History, 1817, the first three series cover Scottish history to the quelling of the '45 rising.

Tales of Hoffmann (Fr. Les Contes d'Hoffmann). Opera by Offenbach. The libretto by Barbier consists of a prologue introducing Wilhelm Hoffmann (1776-1822), a German romantic writer, and three acts (presenting ideal types of women) which recount separate episodes: that of the doll, the Venetian courtesan, and the story of Antonia. Offenbach, who worked on the score for many years, did not live to see it produced. It was revised and partly orchestrated by Guiraud, and staged at the Opéra Comique, Paris, Feb. 10, 1881, where it ran for 101 performances. First performed in London (in German) at the Adelphi, April 17, 1907, it became popular in its English version, first conducted by (Sir) Thomas Beecham at His Majesty's, May 12, 1910. Its most famous airs include the doll's song, and the trio for women's voices, commonly called the barcarolle.

Tales of My Landlord. The general title under which Scott included his stories *The Black Dwarf* and *Old Mortality* (First Series), *The Heart of Midlothian* (Second Series), *The Bride of Lammermoor* and *A Legend of Montrose* (Third Series), and *Count Robert of Paris* and *Castle*

Dangerous (Fourth Series). The Tales are represented as having been left in MS. by one Peter Pattieson, "collected and reported" to defray his funeral expenses, by his "learned friend and patron" Jedediah Cleishbotham, schoolmaster and parish clerk of Ganderclough. The "landlord" is the host of the Wallace Inn, Pattieson's headquarters.

Talgai Skull. Fossil human cranium found in 1884 in the Darling Downs squatting district near Talgai, S. Queensland. It attracted no attention until the Sydney meeting of the British Association in 1914. A report presented by Dr. S. A. Smith of Sydney to the Royal Society in 1918 showed the skull to be that of a lad about 16 years old, who was contemporary with Pleistocene marsupials now extinct. His brain capacity was larger than that of modern Australian aborigines, and his enormous palate, while resembling that of the anthropoids more closely than any human jaw existing, finds its nearest affinity in the palate of the recently extinct Tasmanians.

Tali. Town in Yunnan prov., China. It is situated at a height of 6,700 ft., on the bank of the Erhhai Lake. Tali lies on the road connecting Peiping with Burma, in a fertile district amid hills rich in minerals. It was the capital of a native kingdom which was conquered by the Mongols in 1253. The walls were constructed under the Ming dynasty in 1382. In 1873 the town was laid waste after the Panthay revolt. Pop. 12,851.

Taliesin. Traditional 6th century bard of the Cymri, credited with the authorship of a number of tales of contemporary heroes, and prophetic and other verses, many of which are certainly of a later date. Much of the legend of Taliesin's life is given in Lady Charlotte Guest's *Mabinogion*, 1902, and the poems of the *Book of Taliesin* are included in W. F. Skene's *Four Ancient Books of Wales*, 1868.

Talipot Palm (*Corypha umbraculifera*). Tree of the family *Palmae*, native of S. India and Ceylon. The trunk is about 80 ft. high. The leaves are circular, about 12 ft. in diameter, thrown into plaits, and the margin cut into points; the leaf stalk about 6 ft. long, armed with tooth-like spines. The leaves are used as fans and umbrellas. Strips are used as paper, and for weaving into baskets and mats.

Talisman. Word of Arabic origin meaning a charm. It refers usually to an inanimate object that possesses supernatural powers, generally in the direction of keeping off evil. Talismans often consisted of precious stones engraved with mystic symbols and lettering. See Abraxas; Amulet; Magic.

Talisman, THE. Second of Sir Walter Scott's Tales of the Crusaders. Published with *The Betrothed* in June, 1825, it is a story of the adventures of Richard I in the Holy Land and is characterised by the masterly development of its plot and the brilliancy of its scenic colouring.



Tallboy in walnut, Queen Anne period : height, 6 ft. 2 ins.; width, 3 ft. 3 ins.

By courtesy of Gill & Reigate, Ltd., London

Tallage (Fr. *tailleur*, to cut). Tax levied on English boroughs. It appears to have been introduced in the 12th century. It was a tax levied by the king on the land in his own demesne, and became in practice a tax on all English boroughs. The barons were allowed for a time to levy tallages. Gradually, however, this method of taxation fell into disfavour, as grants of money were made by parliament, and in 1340 tallages were forbidden except by consent of parliament.

Tallahassee. State capital of Florida, U.S.A., the co. seat of Leon co. It is 20 m. N. of the Gulf of Mexico, and is situated on a hill in a region of lakes and streams. Its streets are spacious and shady. Here is the centre of Florida govt., the Florida State College for women, and an industrial school for negroes. The city is a centre for

trade in cotton, tobacco, cereals, fruit, and vegetables, and there are rly. shops. It has a municipal airport and is served by the Georgia, Florida, and Alabama, and the seaboard Airline rlys. In 1818 the area was cleared of Indians, and in 1824 Tallahassee was made capital of the then territory of Florida. Pop. est. 18,000.

Tallard, CAMILLE D'HOSTUN, DUKE OF (1652-1728). French soldier and diplomatist. He was born Feb. 14, 1652, and had a brilliant military career, being a general at 40 and winning a victory at Spire in 1693; but was defeated by Marlborough at Höchstädt or Blenheim, Aug 2 (O.S.), 1704 (at which battle, however, he did not hold supreme command). Tallard was sent to England, where he had previously been French ambassador to William III at the time of the Spanish treaties, and successfully adopted the rôle of a country squire near Nottingham. Here he introduced the cultivation of celery. He died in Paris, having been restored to his honours, March 30, 1728.

Tallboy. Double chest of drawers, placed one above the other, the upper usually being narrower and recessed. High-boys (Fr. *hautebois*) are much the same, but have taller top sections. Low-boys are small chests of drawers placed on tall legs, usually of the cabriole type. These were all popular in the Queen Anne period, and good specimens were produced well into the Georgian period, after which they were largely replaced by the wardrobe.

Talleyrand-Périgord, CHARLES MAURICE DE (1754-1838). French statesman. Born in Paris Feb. 13,



1754, he was the son of a count. An accident in childhood lamed him, precluding him from military service, and transferred the succession to a

C. M. de Talleyrand
After Gérard

younger brother. Talleyrand consequently entered the Church, becoming a priest in 1778. Preferment followed, and in 1789 he was made bishop of Autun, representing his diocese when the states-general assembled that year.

He was quick to range himself on the side of safety and the Revolution, acquired a position of distinction in the national assembly,



and attacked the privileges of the Church. Accepting the civil constitution of the clergy, he relinquished his orders in 1791, and was excommunicated. Next year he went to England on an unofficial political mission, the French monarchy not having as yet been formally ended. To the extremists, however, he was suspect, and, being denounced by that party while he was in England, did not return to France until 1795, when the Terror was past. Through the friendship of Mme. de Staël he gained that of Barras, drew his attention to the genius of Bonaparte, and became the foreign minister of the Directory in 1797. A temporary retirement was followed by a return to the same office after the establishment of the Consulate.

Talleyrand was foreign minister to Napoleon from 1799 until the treaty of Tilsit, 1807, after which he retired with the title of prince of Benevento. There was then a breach, which gradually widened, between them. Talleyrand had supported the emperor's largely beneficial organization of the German and Italian principalities, but had opposed the breach with England, and now objected to aggressive policy against Russia and in the Peninsula. Talleyrand accordingly took the lead in the faction which worked against the emperor, and on the latter's deposition in 1814 was rewarded by becoming foreign minister to Louis XVIII.

His extraordinary diplomatic talents enabled him to play a part of immense value to France at the congress of Vienna, to secure her recognition on an equal footing with the four Great Powers. He was lord chamberlain from 1815; supported Louis Philippe's assump-



Tallinn, Estonia, S.S.R. The castle with its 700-year-old tower. Above, the Market Square

tion of the throne, 1830; and as ambassador in London he established friendly relations between Great Britain and the Orléans monarchy. He retired finally in 1834, and died May 17, 1838. Talleyrand was a man of great charm, intellect, and adaptability, who, though obviously ill-suited to the ecclesiastical profession, notably served France whether she was governed by revolutionaries, Napoleon, or the Bourbons. His *Mémoires* were edited by the duc de Broglie, Eng. trans. 1891-92; and A. Duff Cooper's biography, 1932, superseded earlier ones in English.

Tallien, JEAN LAMBERT (c. 1767-1820). French revolutionary.

Born in Paris, he became a notary's clerk engaged in Jacobin politics, and in 1792 entered the national convention, where he was noted for his violent attacks on the king. He defended Marat, 1793, and in 1794 was sent to suppress an insurrection in Bordeaux, where he proved a sound Terrorist. His career makes the most distasteful reading, for as president of the convention he engineered the overthrow of Robespierre;



Jean L. Tallien, French revolutionary

then entered the committee of public safety and suppressed the Jacobins; worked for the Thermidor reactionaries; and was one of the council of Five Hundred, 1795-98. He died in obscurity in Paris, Nov. 16, 1820.

Tallinn. Capital of Estonia S.S.R. and a Baltic seaport. The former Reval, it is built on a small bay on the S. of the Gulf of Finland, opposite Helsinki, and 232 m. W.S.W. of Leningrad by rly. The fine sheltered harbour is ice-free for nine months. Rising from the shore to high rocky land whereon are ancient fortifications and govt. buildings, Tallinn presents a grand appearance from the sea. Divided into upper and lower towns, it contains a cathedral and castle, medieval guild houses, museums, and a palace built by Peter the Great. Among its churches, S. Olai has a tower 463

ft. high. The technical faculty of the Estonian university at Tartu moved here as an independent university, 1936. There is the largest factory for making textile fibre from glass in the R.S.F.S.R. Some of the world's finest veneer and three-ply fabric is made from the Estonian birch forests. Shipbuilding, distilling, and pulp and paper making flourish. Pop. 146,400.

Founded by Waldemar II of Denmark in 1219, Reval was a prosperous Hanseatic town during the Middle Ages, and was long held by the Livonian knights. Made over to Sweden, 1561, it was besieged by Peter the Great, and annexed to Russia, 1710. It was seized by the Germans on Feb. 25, 1918. With the setting up of Estonia as an independent state, Tallinn developed as a seaport and an industrial and educational centre. Within the U.S.S.R. from 1940 (see Estonia), it became a Russian naval base. It was captured by the Germans, Aug. 28, 1941, after desperate fighting, and remained in their hands until liberated by the Russians, Sept. 22, 1944, after a 50 m. advance in one day.

Tallis, THOMAS (c. 1505-85). Composer regarded as the father of English church music. He was organist of Waltham Abbey until its dissolution in 1540, and was later a gentleman of the Chapel Royal and organist there with his pupil

William Byrd (*q.v.*). In 1575 they published their 34 motets, 16 of which were by Tallis. He wrote a



Thomas Tallis,
English composer
British Museum

large amount of church music, much of it still in MS., and notably the fine service in the Dorian mode which was published in 1641. Tallis's canon is an adaptation of his eighth

"tune," while his ninth is still sung as a hymn. He died at Greenwich, Nov. 23, 1585.

Tallith. Ritual garment worn by all male Jews at the synagogue. A large square of fine linen, ornamented with a fringe, and with tassels attached by blue thread to the four corners, it is thrown round the shoulders like a shawl during prayer, or can be worn to cover the head. During the medieval Jewish persecutions a small tallith, worn as an under-garment was introduced, and is still worn continuously by pious Jews. *See* Jews; Synagogue.

Tallow. Clarified animal fat consisting chiefly of stearin, palmitin, and olein. Tallow is usually obtained from mutton or beef fat by melting and separating by pressure. Suet is a natural form of tallow. The latter, when pure, is white, almost tasteless, and insoluble in water. It is used in the manufacture of soap, candles, and as a lubricant. *See* Fat; Soap.

Tallow Chandlers' Company. London city livery company. Founded 1426, it was granted arms in 1456, obtaining its first charter six years later. The hall in Dowgate Hill was destroyed by the Great Fire, rebuilt 1672, and restored 1871. Severe damage was caused by a German bomb on May 10, 1941. The company had special privileges in the city and suburbs with regard to tallow, oils, etc.

Tallow Tree (*Sapimum sebiferum*). Tree of the family Euphorbiaceae, native of China. It has alternate, oval leaves with a pair of prominent glands at the top of the leaf-stalk, and the rudimentary greenish flowers are massed in catkin-like spikes. Rather large capsules contain three seeds coated with a substance like tallow, used by the Chinese for candle-making. The seeds yield oil by pressure, the leaves a black dye, and the hard wood is used for engraving printing blocks. The name is also applied to *Pentadesma butyracea*, a tropical African tree of the family Guttiferae, whose juice is yellow and greasy. Its edible fruit is buttery.



Tallow Tree. Leaves and fruit of the tree from which the Chinese extract tallow

ferae, whose juice is yellow and greasy. Its edible fruit is buttery.

Tally (Fr. *tailler*, to cut). Device formerly used for recording payments, consisting of a stick, which was marked with cross notches of various sizes and then split, each party to the transaction retaining a half. Names, dates, etc., were written on the stick. The accounts of the royal exchequer in England were kept by tallies until 1826, although account books were also used. The tallies were stored in a room which had been the star chamber, and in 1834 it was ordered that they should be used for fuel, with the result that the houses of parliament were burnt down in Oct. In some rural districts in England, notably in the Kentish hop fields, and on the Continent, accounts are still kept with tallies. The verb to tally, in the sense of agree or correspond, is derived from the use of tallies.

The name is given to a system of buying and selling goods in which payment is made by instalments. A tallyman visits his customers periodically to collect payments. This must be distinguished from the hire purchase system (*q.v.*). *See* Exchequer.

Talma, FRANÇOIS JOSEPH (1763-1826). French actor. Born in Paris, Jan. 15, 1763, he made his début in 1787 at the Comédie Française, where two years later he created a furore in Chénier's Charles IX. Founding the new Théâtre de

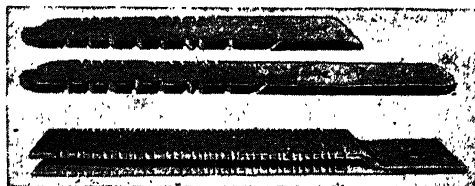


F. J. Talma,
French actor

la République, he achieved a series of successes which made him the greatest tragedian of his time. Napoleon was his friend and patron and in 1808 took him to Erfurt, where he acted *La Mort de César* before an audience of kings, and to Dresden, 1813. Talma died Oct. 19, 1826.

Talmadge. Name of two American film actresses. The elder, Norma, was born at Niagara Falls, N.Y., May 2, 1897, and began to act at 14 in pictures made by the Vitagraph Co. She was one of the first to evolve a distinctive technique of emotional acting in such silent films as *Salome*, *The Criminal*, *Smilin' Through*, and *Secrets*. During 1917-34 she was married to the director Joseph Schenck. Her sister Constance, born at Brooklyn, April 19, 1900, was given a big part by Griffith as early as 1915 in the film *Intolerance*, and made many successes.

Talmud, THE. Compilation which incorporates the labours of the Jewish schools during several centuries. Its basis is the Mishna (repetition), a work which gathered



Tally. Top, the two halves of an ancient tally; below, modern Kentish hop tally before halves are separated

By courtesy of the Trustees, British Museum

up for the most part the traditional legal discussions (called the *Torah*) of the scholars known as Tannaim, repeaters or reciters, who lived between 500 B.C. and A.D. 200. The discussions were committed to writing about 200. The Mishna itself then became the text for further discussions by the scholars, who were active in the schools of Palestine and Babylonia from 220 to 500, and are known as Amoraim, speakers or interpreters. These discussions were called Gemara (lit. completion), and were added to the Mishna to form the Talmud.

There are two works, the Jerusalem Talmud or Talmud of Palestine, completed towards the end of the 4th century or during the 5th century, and the Babylonian Talmud, completed about 500. An edition of the Babylonian Talmud, with English translation by M. L. Rodkinson, was published 1890-1903. There have been many translations of selections, but the first complete and unabridged

translation of the Babylonian Talmud into English appeared in 1949; the work of 31 scholars during 18 years, it was in 34 vols. *See Jews; consult Literary Remains*, E. Deutsch, 1874; Introduction to the Talmud, M. Mielsner, 1894; Short History of Jewish Literature, I. Abrahams, 1906.

Talos. In Greek mythology, a man of brass made by Hephaestus or Vulcan, and presented to Minos, king of Crete. He was destroyed by Jason with the help of the enchantress Medea.

Talos. In Greek mythology, a nephew of Daedalus, the inventor. Talos was credited with the invention of the saw, compasses, the potter's wheel, and other tools. His skill aroused the envy of Daedalus, who murdered him.

Taltal. Seaport of N. Chile, in Antofagasta prov. It ships nitrate and ores from the Atacama desert. Rlys. connect the port with the nitrate works and with the branch railway line at Catalina, 50 m. E.N.E.; and there is a motor road to Antofagasta. Pop. 7,835.

Talus (Lat., ankle-bone). In geology, term applied to the accumulation of rock fragments found at the bases of cliffs and precipices. In architecture the word is used to indicate the slope of a retaining wall.

Talwar or **TULWAR.** Type of Oriental sword. Used in Pakistan, e.g. by the Sikhs and Pathans, and also in Persia, it is especially a horseman's weapon, being a curved sabre well adapted for a sweeping cutting stroke.

Tal-y-Llyn. Lake of Wales, in Merionethshire. Situated at the S. foot of Cader Idris, and sometimes known as Mwyngil, or the peaceful retreat, it is 2 m. long and $\frac{1}{2}$ m. wide, and is drained by the Dysynni, which flows into Cardigan Bay. *See Cader Idris.*

Tamacoari, BALSAM OF. Purple, oily substance obtained from *Caraipa fasciculata*. The latter is a tree of the family Guttiferae. A native of tropical America, it has alternate leaves and sweet-scented, white flowers.

Tamai, BATTLE OF. British engagement during the campaign in the Sudan in 1884. On March 11 Sir Gerald Graham located an Arab force, part of Osman Digna's levies, in a ravine at Tamai, a village near Suakin. In an attack on these tribesmen on the 13th, the first British square was broken. The village was captured, however, with a British loss of about 200 killed and wounded. Tamai was afterwards abandoned, but finally re-

captured, Oct. 7, 1886, with great stores of rifles and ammunition.

Tamar. River of England. Rising in the extreme N. of Cornwall, and flowing S. by E., it forms for the greater part of its length the boundary between that county and Devon. It enters the English Channel after a course of 60 m. through Plymouth Sound by a many-branched estuary called the Hamoaze. It is navigable to Launceston. *See Saltash.*

Tamaricaceae. A family of shrubs and a few trees, natives of temperate and warm regions. They have small alternate leaves, sometimes scale-like, and fleshy, regular flowers. The seed-capsules are leathery, and the plants bitter and astringent. Best known of the few genera constituting the order is Tamarix, of which the tamarisk (*T. gallica*) is familiar.

Tamarind (*Tamarindus indica*). Tree of the family Leguminosae, a native of the tropics. It attains a height of 50 or 60 ft., and has long leaves divided into 20-40 oblong leaflets in two rows. The fragrant, small, red-striped, yellow flowers are in loose sprays, and are succeeded by beanlike pods, 3-6 ins. long; these are brittle, but filled with acid pulp in which the hard seeds are embedded. The outer skin of these pods is removed before they are preserved in syrup to form a gentle laxative medicine. The wood of the tree is valuable for building and for charcoal, and the bark is administered in dysentery and as a tonic. A yellow dye is extracted from the leaves.

Tamarisk (*Tamarix*). Genus of shrubs and small trees of the family Tamaricaceae. Of the



Tamarisk. Feathery leaves and dense spike of blossoms

is an evergreen tree, 6 ft. to 20 ft. in height, with minute, scale-like foliage and dense spikes of white or rosy flowers in late summer. *T. mannifera* exudes manna (q.v.).

Tamatave (Malagasy, Toamasina). Port of Madagascar, formerly capital of the island. It

lies on the E. coast 229 m. by rly. from Antananarivo; it is connected by rly. also with Lake Alaotra in the N. It has a roadstead almost encircled by coral reefs, and from it the greater part of the produce of the island is exported. Here also are meat-preserving factories. Pop. 24,860 (4,282 Europeans). The town gives its name to a prov.

During the Allied occupation of Madagascar in the Second Great War Tamatave was occupied by British troops, which landed Sept. 18, 1942, after a token resistance.

Tamaulipas. Maritime state of Mexico. It has a flat coast on the Gulf of Mexico, touching Texas on the N., and covers an area of 30,731 sq. m. Bordered by the Rio Grande, Panuco, and watered by other rivers, its soil is fertile in the valleys and where irri-



Tamarind. Spray of flowers and foliage of the tree. Inset, pod from which a medicine is extracted

gated. Agriculture and stock rearing are important, and trade is carried on in hides, cattle, fruit, and rubber. Oil is obtained in the S. The capital is Ciudad Victoria. Pop. 458,832.

Tambo. Small river of S. Peru. In the dept. of Moquegua, it rises in several headstreams on the W. slopes of the Andes, and flows N.W. and then S.W. through Arequipa dept. for about 100 m. to the Pacific, near Mejico Point. The village of Tambo, on its banks, is 25 m. E. of Mollendo.

Tambourine. Percussion instrument of Oriental origin. On one side only of a circular wooden hoop is stretched a vellum head, the tension of which is regulated by means of rods with fly-nuts. It is beaten by the hand, or occasionally rubbed by the fingers of the performer. Round the hoop are attached loosely several pairs of light metal plates called jingles.

Tamboy. Town of Russia, capital of the region of the same name. It is on the Tsna and is a

ry. junction, 300 m. S.E. of Moscow. Being in the fertile black-earth zone, it does trade in grain, also cattle, tallow, and wool. Industrialisation proceeded rapidly under the five-year plans. Pop. 121,285.

Tame. River of England. It rises near Walsall, Staffs, and flows 30 m. through Warwickshire, passing into the former county again to join the Trent about 7 m. below Tamworth, where it picks up the Anker.

Tamerlane, TAMBURLAINE, OR TIMUR (1336-1405). Tartar conqueror. *Timur i leng*, Timur the lame, was born, son of the ruler of the Berlas tribe, near Samarkand. In 1358 he began his military career by invading Khorasan, and was soon appointed governor of Kesh. Bravery and cunning made him a powerful chieftain, and in 1369 he was crowned king of Samarkand. Declaring himself sole ruler of Turkistan, he began the series of conquests which made his name famous in the medieval world. His victorious armies reached the Caspian, subdued most of Persia, and routed the Golden Horde (*q.v.*). In 1398 he invaded India and sacked Delhi, carrying back to his favourite city of Samarkand enormous booty. His victorious war against the Turks and Egyptians resulted in the seizure of Damascus and Aleppo, and culminated in the defeat and capture of Bayazid I, 1402. Tamerlane then planned the invasion of China, but died in the midst of his preparations, Feb. 17, 1405. With his death his empire fell to pieces. He must not be thought of merely as a bloodthirsty conqueror, for he had intervals in which a cultured and scholarly court was established. Marlowe's tragedy, *Tamburlaine the Great*, fairly portrays his character.

Tamil. Agglutinative speech of the Dravidian language-family, spoken in S. Madras, N. Ceylon, and by the Indo-China Klings. Its six dialects are spoken by perhaps 20 millions. It has given to English such words as cheroot, curry, pariah, mulligatawny. The Tamil-speaking peoples are the most virile element in the S. Indian population. Many have emigrated to Ceylon, Mauritius, and the E. and W. Indies.

Tamil literature developed under the Jains during the 9th-13th centuries. The first important work is the *Naladiyar*, a collection of moral sayings. The masterpiece of Tamil literature is generally

acknowledged to be the *Kural*, written by Tiruvalluvar; this is a didactic poem dealing with the moral aims of man and embodying the philosophy of Buddha. His sister is supposed to be the author of the best poems in the language. The Jain period was followed by a Siva period of the 14th and 15th centuries. After two centuries of stagnation, literature revived under one of the kings, himself a poet, under whom many imitations and translations of Sanskrit were produced. The 17th century is known for the Sittar, a religious sect to whom numerous mystical poems are due. Later literature is modified by English influence. See Ceylon; Dravidian Languages; India; Nose Ornament.

Taming of the Shrew, THE. Comedy by Shakespeare. Christopher Sly, a drunken tinker, is put to bed and treated, on waking, as a man of quality, newly cured of madness. Before him is presented the play, which concerns the wooing of Katharina, the shrew, by Petruchio (*q.v.*) and that of her sister Bianca by Lucentio. The comedy, indebted to an old play of 1594, *The Taming of a Shrew*, and to *The Supposes*, a play adapted by Gascoigne from Ariosto's *I Suppositi*, was first printed in the 1623 folio, and is conjectured to have been partly written by another hand. The induction recalls *The Sleeper Awakened* of *The Arabian Nights*. In the most familiar passage of the play, Katharina pronounces at last that obedience is the duty of a wife. The play has 2,671 lines, including 516 of prose, 1,971 blank verse, and 169 pentametric rhymes. It was revived several times by the Bensons, and played in modern dress at the Court Theatre, 1928, and New Theatre, 1937.

Tammany Hall. Organization in New York. Properly designating the building in which is housed a political organization, the term has come to be applied to the organization itself. The genesis of the movement is to be found in the Society of S. Tammany (the name being a corruption of Tamanend, a reputed Indian sage), formed May 12, 1789, by William Mooney. This society concerned itself at the outset with social and benevolent objects, but before long it assumed a political cast, and from 1800 onwards it has identified itself with the National Democratic party; a fact which does not necessarily imply that the National Democratic party identifies itself with Tammany. The institution has

also devoted much of its activities to municipal politics, and since 1834 a majority of the mayors of New York have been the nominees of Tammany.

All the districts of New York have their leaders, who, together with representatives elected by the district, form the central general committee which is the governing body of the institution.

Much of the real power of Tammany is in the hands of its head for the time being, known as the boss. The first of these was William M. Tweed, and his successors included Richard Croker and Charles F. Murphy. Tweed—and not he alone—left an unenviable reputation, having been proved in 1869-71 to have robbed the city of millions of pounds by systematic corruption. The methods of Tammany again came in for severe criticism in 1890 at the hands of the state committee on cities, and from other similar bodies in 1894, 1899, and 1931.

Tammerfors. Town of Finland described under Tampere.

Tammuz. Fourth month of the Jewish sacred, and tenth of the civil, year. It is not mentioned in the Bible; but the fast for the Taking of Jerusalem is now observed on its 17th day. See Calendar.

Tam o' Shanter. A poem by Burns. It tells how Tam, after drinking late at Ayr, rode home through a storm past Alloway's haunted kirk, where he saw a dance of witches who pursued him. It is a masterpiece of the humorous and the eerie. The photograph MS. by the poet was offered for sale at Christie's in 1921. Tam o' Shanter has given his name to a loose cap of Scottish origin, with a knob or tassel.

Tampa. City of Florida, U.S.A., the co. seat of Hillsboro co. A port of entry on the W. coast, it stands at the mouth of Hillsboro river on Tampa Bay, and is served by the Seaboard Air Line and other rlys. Tampa leads the world in the output of hand-made cigars, though the industry is also mechanised. An extensive trade is carried on in phosphates, vegetables, grape fruit, cattle, lumber, and fish. Also manufactured here are foundry and machine-shop products, wagons, motor vehicle bodies, furniture,



Tam o' shanter, the Scottish cap



Tamworth, Staffordshire. Gateway of the 17th century castle, now used as a museum

safes, bricks, and tiles. Tampa was chartered as a city in 1886. Pop. est. 124,476.

Tampa Bay. Arm of the Gulf of Mexico. On the W. coast of Florida, U.S.A., it extends inland for about 20 m., and has a mean breadth of 7 m. and a maximum depth of 24 ft.

Tampere OR TAMMERFORS. Principal manufacturing city of Finland. It lies 85 m. by rly. N.N.E. of Turku, being a junction, on both sides of the Tammerkoski; rapids join the lakes Näsijärvi and Pyhäjärvi. The industries are concerned with all kinds of textiles, paper, leather goods, and there are several ironworks. During 1918 Finnish Bolsheviks and constitutionalists and Germans were all involved in fighting. Pop. 87,123.

Tampico. Seaport of Mexico, in the state of Tamaulipas. Once the world's greatest oil port, it stands on the river Panuco, near its entrance to the Gulf of Mexico, 206 m. N.N.E. of Mexico City, with which it is linked by highway, rly., and air service. It carries on an active trade, the chief articles of export being rubber, sugar, maize, asphalt, and oil from the near-by oilfields. Pop. 84,037.

Tamping. Technical term designating (1) the operation of packing or stemming an explosive into a borehole or other cavity preparatory to firing a shot; and (2) the material such as clay, sand, or a steel or wooden plug placed above the explosive in a borehole to confine it. Tamping, to be efficient, must be tightly packed round the fuse and no air space left between it and the explosive charge, otherwise the effect of the shot will be reduced owing to escape of gas.

Tamsui. Seaport of Formosa. It stands at the mouth of the river Tamsui, on the N.W. coast, and is the port for Taipei, the capital of the island, with which it has rly. communication. A flourishing trade is carried on in rice, sugar, tea, camphor, coal. Pop. 18,562.

Tamworth. Mun. borough and market town of Staffs, England. It stands on the Tame at its junction with the Anker, 15 m. N.N.E. of Birmingham, and has rly. services. When Tamworth was the capital of Mercia, the chief Saxon kingdom, Offahad a palace here.

Ethelfleda, daughter of Alfred, in 913 raised the artificial mound on which the present castle stands and erected a fortress. The Norman tower and keep date from the reign of William the Conqueror; the banqueting hall from that of Henry VIII. The castle belongs to the corporation and contains a museum. Other buildings include the parish church of S. Editha, rebuilt in the 14th century; town hall, given by Thomas Guy in 1701;



Tanagra. Terra-cotta figures of the type of pottery made at Tanagra

Moat House, an Elizabethan mansion; and Guy's almshouses. Tamworth had two M.P.s 1562-1885, and thereafter one until the gen. election of 1945, when it was divided between Solihull and Sutton Coldfield; from 1950 the borough voted with Lichfield and the rural dist. in Sutton Coldfield. Peel issued his Tamworth manifesto while he was its M.P. (1833-50); his statue is in the market place. The town gives its name to a hardy breed of pig (*q.v.*). Paper, clothing, terra-cotta, and textiles are made, while the N. Warwickshire coalfield adjoins the town. Pop. 13,000.

Tamworth. Town of New South Wales, Australia. On Peel river, 281 m. by rly. N. of Sydney, it is a pastoral and farming centre. The dist. also produces gold and diamonds. Pop. 12,071.

Tan. Bark of oak, beech, birch, and other trees, and the leaves and nuts of some, shredded and steeped in water for the preparation of leather (*q.v.*). See Tannin.

Tana. A river of Lapland. Formed from the Anar and Karas, it flows N.N.E. to reach Tana Fjord in the Arctic Ocean after a course of 220 m. For much of its course it divides Norway from Finland. There is a salmon fishery.

Tanager. Large family of finch-like birds, inhabiting tropical America. There are numerous



Tanager. The blue species of tropical America, *Tanagra episcopus*

genera and some 400 species, remarkable for their gaudy plumage. They feed mainly on fruit and insects, and some are songsters.

Tanagra. Town of ancient Greece, in Boeotia, near the frontier of Attica. It was the scene of a great defeat of the Athenians by the Spartans in 457 B.C. Excavations on the site yielded terra-cotta figurines, which have thrown light on ancient Greek costumes.

Tanaland. Prov. of Kenya Colony. It includes the dists. of Lamu and Kipini, and extends on both sides of the Tana river. Its capital is Lamu, long the headquarters of Arab civilization on the coast. The Tana river rises from the snows of Mount Kenya and flows at first N. and then S.E. It is about 450 m. long and rather turbulent in the upper reaches, but can be navigated by small launches for about 20 m. The prov. is sparsely populated by Arabs, Swahilis, and Gallas.

Tananarive. French form of the name of the capital of Madagascar, Antananarivo (*q.v.*).

Tanaro. River of N.W. Italy, in Piedmont. It rises in the Maritime Alps and flows N. and N.E. past Asti and Alessandria to join the Po below Valenza after a course of 125 m. Its chief affluents are the Stura and Bormida.

Tancred (c. 1050-1112). Leader of the First Crusade. Accompanying his uncle, Bohemond, prince of Tarentum, to Constantinople, in 1096, he entered the service of the emperor Alexis and set out for the Holy Land. On his way he seized Tarsus, but, driven out by his rival, Baldwin of Lorraine, he joined the army of Crusaders

before the walls of Antioch. There and later in the siege of Jerusalem Tancred performed prodigies of valour, and after the battle of Ascalon was made prince of Galilee, 1099. Unable to prevent Baldwin's assumption of the crown of Jerusalem, he retired to Antioch, of which town he became prince in 1111, and there he died the following year. *See* Crusades.

Tandem (Lat., at length). Term used for the driving of two horses, one in front of the other. Hence the term came to be used for a tandem bicycle, a machine for two riders, seated one in front of the other, the driving power being derived from two sets of pedals at the same time. *See* Driving; Rein.

Tandy, JAMES NAFFER (1740–1803). An Irish patriot. Born in Dublin, he was the first secretary of the United Irishmen, 1791. He was an ardent sympathiser with the French Revolution and organized an armed force similar to the Parisian National Guard. He was forced to take refuge in America, remaining there until 1798, when he went to Paris. There he joined Wolfe Tone (*q.v.*). He made an abortive landing in the Donegal island of Aran, Sept. 16, 1798. He afterwards set sail for Hamburg, where he was handed over to the British government. Although found guilty of treason he was reprieved, and died in France, Aug. 24, 1803.

Tanga. Port of Tanganyika Territory. Tanga is situated on a beautiful land-locked harbour opposite the island of Pemba, and is the coastal terminus of the Usambara rly. to Moshi on the S. slopes of Mt. Kilima-Njaro. There are rly. workshops. Most of the livestock sent to Zanzibar is from Tanga. Population about 18,000, including 300 Europeans. *See* East Africa, Conquest of.

Tanganyika. Lake of south-central Africa. It lies between Tanganyika Territory and the Belgian Congo, and extends 450 m. from N. to S. and into Rhodesia. It is the longest fresh-water lake in the world and has an area of about 13,000 sq. m. For most of its length it is 40 to 50 m. wide. It lies 2,550 ft. above sea level. The waters are more than 1,000 ft. deep (greatest depth 4,708 ft.), the lake forming part of the Great Rift Valley of central Africa. The shores generally, except S. of Ujiji, are mountainous, especially on the Congo side. The best harbours are situated on the E. littoral and include Kigoma, terminus of the

rly. from Dar-es-Salaam, Ujiji, Karema, Kirando, Kasanga, and Kituta, the last being at the extreme S. Albertville is the principal harbour on the Belgian side and is the terminus of the rly. to Kabalo on the Lualaba-Congo river.

Tanganyika was discovered by Burton and Speke in 1858, and was subsequently explored by Livingstone, Stanley, and others.

Tanganyika Territory. Area in E. Central Africa. With the dist. of Ruanda and Urundi in the N.W., which were joined to the Belgian Congo, and a small dist. S. of the Rovuma river, now part of Mozambique, the territory until

is a narrow coastal plain with palms and mangroves. The capital is Dar-es-Salaam (*q.v.*).

The topographical character of the country varies from the low-lying swampy ground near the coast to the highest mts. in Africa, notably Kilima-Njaro, 19,325 ft. The coast belt varies in width from 10 to 40 m. Behind this plain the country rises gradually to the great central plateau which comprises the major portion of the Territory. It has an average height of about 4,000 ft., and is covered with jungle forests and impenetrable bush.

The principal rivers flowing into the Indian Ocean are: the Pangani,

which rises in the snows of Kilima-Njaro, the Rufiji, which is navigable by small vessels for about 60 m., the Rovuma, 500 m. long, the Matandu, and the Wami. Rivers flowing into the Great Lakes include the Mori, Mara, and Kagera to Lake Victoria, the Magarasi to Lake Tanganyika, and the Songue and Ruhuhu to Lake Nyasa.

The land now called Tanganyika is believed to have possessed a civilization before the Christian era. In 1498 Vasco da Gama sailed along its coast on his way to India, and the first Portuguese settlement, at Kilwa, followed in 1500. The Portuguese were prevented from spreading by the Arabs of Oman and Zanzibar, who grew rich upon the profits of the slave trade. About the middle of the 19th cent. the Germans became interested in the country and, chiefly through the efforts of Karl Peters, it was proclaimed a German protectorate in 1885. For a time there were many minor clashes with the natives, and in 1905 there was a serious rising at Maji Maji, ruthlessly suppressed by the Germans. In 18 months more than 120,000 natives lost their lives. In 1917, after clashes between German and British forces, the Germans were driven over the river Rovuma into Mozambique (*see* East Africa, German) and Great Britain became



Tanganyika Territory. Map of a part of East Africa administered by the U.K. under United Nations trusteeship

the First Great War comprised German E. Africa.

Administered by Great Britain from 1920 under mandate from the League of Nations, the territory, still under U.K. administration, was placed under United Nations trusteeship in 1946.

It has a coastline, lined with mangrove swamps, 470 m. long on the Indian Ocean, and reaches Lake Victoria in the N.W., Lake Tanganyika in the W., and Lake Nyasa in the S.W. It adjoins Mozambique on the S., Belgian Congo on the W., and forms a British connexion between Northern Rhodesia and Nyasaland on the S.W. and Uganda and Kenya Colony on the N. Its area is about 360,000 sq. m., including 20,000 sq. m. of water. Off the coast lie the islands of Zanzibar and Pemba, and the low coralline island of Mafia. Behind the coral reefs

responsible for the administration of the country.

In 1920 an order in council established administration by a governor assisted by an executive council of 10, of whom four are unofficial members. A legislative council of 30, including the governor, was set up in 1926; in 1948 it had as unofficial members seven Europeans, four Africans, and three Indians.

The est. pop. consisted (1946) of 5,648,015 Africans, 57,765 Asiatics (of whom 23,422 were Indians), and 245 Europeans. The majority of the Africans are Bantus, but more than 120 different tribes have been distinguished; in the N.W. there is much Hamitic blood. Many dialects are spoken, but Swahili is understood all over Tanganyika.

The density of pop. varies from 1.7 per sq. m. in the Masai dist. on the Kenya border to 111.5 per sq. m. in the Rungwe dist. in the S.; the average is 13.7 per sq. m. Two-thirds of the country is uninhabitable because of the presence in some areas of the tsetse fly, and in others the absence of water.

The Africans grow their own food, maize, millet, yams, bananas, and coconut palms. Most of the Asiatics are engaged in retail trade; Asiatics also act as merchants and middlemen. Most of the Europeans are in govt. service or engaged in the production of commodities for export, chief of which are sisal, diamonds, coffee, gold, and cotton. Tea, ground-nuts, sugar, and tobacco are also exported. The development of ground-nut cultivation begun by the British govt. in 1947 envisaged bringing under cultivation 5,000 sq. m. of scrub (two-thirds of the area in Tanganyika) by the use of mechanised land-clearing and other agricultural implements. The scheme involved also clearance of the tsetse fly from the area chosen; the settlement of some 60,000 Africans; the creation of a deep-water harbour at Mikindani; and the construction of a rly. from there 135 m. inland to Nachingwea. (See Ground Nut Scheme in N.V.).

The territory is served by the Central rly. from Dar-es-Salaam to Kigoma on Lake Tanganyika, with a branch to Lake Victoria, and the Tanga line from Tanga to Arusha, linking with the Kenya and Uganda rlys. with which the Tanganyika rlys. were amalgamated, 1948. In the East African rlys. and harbours administration. Steamers connected with the rly. service ply on the three lakes.

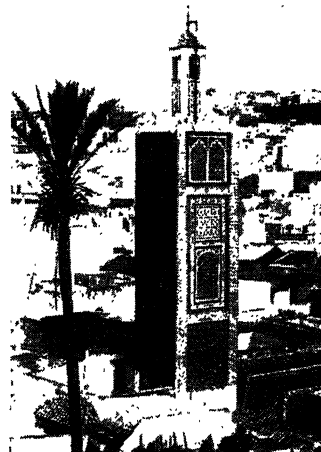
Motor traffic is possible over 21,000 m. of roads in the dry season. The Great North Road is a first-class all-weather highway.

The govt. maintains primary schools for European and a small proportion of African children and aids most of the Indian schools (80 out of 83 in 1946). There is no secondary education for European children, but bursaries are granted for their education in Kenya and S. Africa. See Kilima-Njaro. *Consult Handbook of Tanganyika*, G. F. Sayers, 1930; *My Tanganyika Service*, D. Cameron, 1936; *East Africa and Its Invaders*, R. Coupland, 1939; *Tanganyika Territory*, C. Leubuscher, 1943.

Tangent (Lat. *tangere*, to touch). In geometry, a straight line touching a curve or a surface, i.e. cutting it in two consecutive points. If a line be drawn through any two points of the curve's path, and then while the one remains fixed the other is brought into coincidence with it, the line in its final position is a tangent at that point, which is called the point of contact of the tangent. The slope or gradient of the tangent indicates the direction of the curve at the point of contact. The slope of the tangent at any point of the curve is given by the differential coefficient of the function of the curve. The tangent of an angle B is the ratio of the side AC to the side BC of a right-angled triangle ABC, right-angled at C. It is written $\tan B$. See Calculus; Geometry; Trigonometry.

Tangier. Seaport of Morocco. Situated on a bay of the Strait of Gibraltar it is 36 m. S.W. of Gibraltar, and is the diplomatic h.q. and largest commercial centre of Morocco. Tangier was taken from the Moors in 1471 by the Portuguese, from whom it passed to the English in 1662 as part of the dowry of Catherine of Braganza on her marriage to Charles II. It remained in English possession until 1684. Later the h.q. of Moorish pirates, it interested the Mediterranean powers and Great Britain because of its strategic position and potential commercial value; and in 1912 the British, French, and Spanish govts. agreed to set up an international zone to include the port and some 225 sq. m. of the hinterland. The First Great War prevented the agreement from being implemented, but in 1923 Tangier was internationalised under a convention signed by the three countries, although Moroccan sovereignty was recognized.

In 1928 a revised statute of Tangier signed in Paris gave Spain a more privileged status and brought Italy into the administration. The convention provided for complete international administration of the zone, except that native affairs were reserved to the Moroccan authorities. The zone, demilitarised and neutral, was policed by Spain. Legislative power was vested in an international assembly of 27 members; a committee of the consuls-general of the signatory powers had the right of veto; and administration was



Tangier, Morocco. View showing the lofty minaret of the Great Mosque

entrusted to a French head with assistants. A Muslim mendoub was ex-officio president of the assembly.

In June, 1940, Spain took over administration by military force, with the alleged object of maintaining the zone's neutrality in the Second Great War; and on Nov. 4 the Spanish commander deposed the French administrator and dissolved the legislative assembly. Next year Spain ejected the mendoub and installed the German consul in his stead, but in 1944 Allied pressure obliged the Spanish govt. to expel the latter. A conference on Aug. 31, 1945, of representatives of France, Great Britain, the U.S.S.R., and the U.S.A. called upon Spain to vacate the Tangier zone, restore the rights of the sultan of Morocco, and replace international administration on the basis of the convention of 1923 but with the U.S.A. and U.S.S.R. represented. On Oct. 11 the last Spanish troops withdrew, and in Dec. a Belgian military mission arrived to reorganize the police.

Besides an extensive shipping trade, Tangier has some popularity as a holiday resort. A rly., 200 m. long, to link the port with Fez was completed in 1947. Pop. 100,000, including many Spanish Jews. See Morocco.

Tangle Seaweed OR SEA GIRDLES (*Laminaria digitata*). Large olive seaweed of the family



Tangle Seaweed. Long fronds growing upon rocks uncovered by the tide

Laminariaceae. Attached to northern maritime rocks below ordinary low tides, it has a solid stem, as much as six feet in length and from an inch to two inches thick. The thick, leathery frond is six or eight feet long and is cut into broad segments. Like all the other Laminarias, the tangle annually throws off the frond. See Algae.

Tangmere. Village of Sussex, England, situated 6 m. E.N.E. of Chichester. Its aerodrome was a station of Fighter Command in the Second Great War, heavily bombed in July, 1940, and prominent in the battle of Britain. In 1942 it was the scene of a serious accident when several officers lost their lives during a demonstration with mustard gas. The small church of Tangmere has Saxon work and a 10th century yew in the churchyard.

Tango. Modern dance founded on an old gipsy dance of Moorish origin imported into Argentina from Spain. It was much performed by American negroes, and in the 20th century acquired popularity in the ballroom, being introduced into England in 1912. It has hardly been displaced as one of the standard dances, though calling for a different technique from the others. See Dancing, Ballroom.

Tangut. People of Tibetan stock and speech. They live on the N.E. Tibet borderland and in the Kansu prov. of China. Estimated at 500,000, these squat, dark-brown people are predatory tent-dwelling pastoral nomads or hut-dwelling husbandmen.

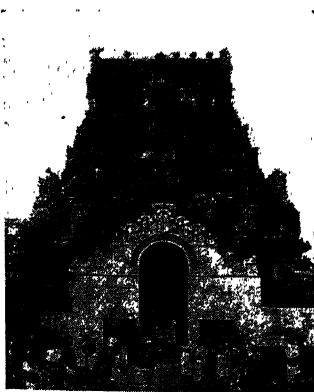
Tanis. Ancient city near San, 13 m. S.W. of Port Said, Lower Egypt. It is the biblical Zoan (Num. 13), on the Tanitic arm of the Nile. Here in 1884 Petrie inaugurated the scientific exploration of an-

cient Egypt. The city has yielded fine sphinxes, notably of Amenemhat III. In 1940 Montet discovered the tomb of Pharaoh Psusennes, and six years later that of the captain of his bodyguard. The funerary chamber contained a magnificent collection of gold and other ornaments, which contradicted the theory that the XXIIst dynasty was a period of artistic degeneracy.

Tanit. Phoenician goddess. A temple at Carthage originally founded in her honour was preserved by the Romans after the fall of the city, the temple being at that time consecrated to the goddess Astarte. Of vast dimen-

sions, it was one of the glories of Roman Africa, and the Christians transformed it into a church. About 400 it disappeared. The site, first discovered in 1885, was excavated in 1921-22. See Carthage.

Tanjore OR TANJUR. Dist. and town of Madras state, India. The dist. is S. of the Cauvery, of which the delta comprises a fertile area sometimes called the garden of S. India. It is highly irrigated. Under the rule of the Cholas during the whole of their supremacy (907-1310), Tanjore was conquered in the 14th cent. by the brother of Sivaji, the great Mahratta ruler, who set up a dynasty. In 1749 the British restored a deposed raja and thirty years later the territory was ceded to the British by treaty with Raja Sarfoji, the latter retaining only the capital and a small tract of country. The state lapsed entirely to the British govt. in 1853. Tanjore contains many monuments of Hindu art and early civilization. The buildings include the great temple or pagoda of



Tanjore, Madras state, India. The Tower Gate

Brihadi-Swara, the foundation of which is attributed to Raja Chola (985-1014). There is also the palace, built in the middle of the 16th cent., which has a library containing more than 18,000 manuscripts in Sanskrit, Tamil, and other Indian languages. A remarkable building is the church, named after C. F. Schwartz, who founded the Tranquebar mission; begun in 1779, this contains a white marble group of figures representing the death of Schwartz. Tanjore is a rly. junction and its industries include manufactures of silk, carpets, jewelry, repoussé work, copper ware, and models in pith. Dist. area 3,727 sq. m., dist. pop. 2,563,375; town pop. 68,702.

Tank. Receptacle for the storage of fluids. The petroleum industry, in particular, uses tanks of various designs and of sizes varying from 100 barrels (3,500 gall.) to 200,000 barrels (7,000,000 gall.). Wooden tanks with capacities up to 2,000 barrels are sometimes used for very corrosive crude oils, but steel is a more usual material. Galvanised, corrugated-iron tanks with riveted and soldered joints are made in sizes up to 2,500 barrels. Another pattern (up to 10,000 barrels) is built up from drilled steel plates, bolted together on the site. Larger tanks are assembled on the spot where they are to be used, and the plates welded or riveted together. The liquids thus stored are crude oils and refined products of all types, and their volatility varies widely.

Tanks for non-volatile liquids have a fixed, slightly conical roof and present no special problems in design. The storage of volatile liquids is complicated by the need to minimise evaporation losses due to temp. changes and to emptying and filling. When the contents of the tank are frequently changed, a roof which floats on the oil is used. When the oil remains a long time without change a tank with a flexible roof which can bell out or sag, according to atmospheric temp., is suitable, or the vapour space of a fixed roof tank is connected with a gasometer. Liquefied gases with high vapour pressures are stored in spherical tanks.

The collection of tanks at pipeline termini, ports, and refineries is called a tank farm. Tanks should be as far apart as possible and surrounded by a bank or wall to retain any escaping oil. Such tanks should be coated with aluminium paint to reflect the sun's heat, and full fire-fighting equipment is essential.

TANKS AND TANK WARFARE

Lt.-Gen. Sir Gifford Le Q. Martel, Commander, R.A.C., 1940-42

This article, by one who was associated from the beginning with the development of the armoured vehicle called for secrecy a tank, gives its history and explains its use in warfare. See also Amphibious Craft; Armoured Vehicles; Blitzkrieg; Caterpillar Track; Churchill Tank; Fortification; Landing Craft; Matilda Tank; Panzer; Royal Armoured Corps; Royal Tank Regiment

The name tank was given Dec., 1915, as a blind to a bullet-proof, armed vehicle constructed secretly in the U.K. which was driven by mechanical power and fitted with caterpillar tracks that made it possible to drive across obstacles. The name continued to be used after the machine had appeared in the field. To the British is thus due the conception and introduction of a weapon destined to exert a great influence on warfare.

From the earliest times, men have attempted to find methods whereby they might move under some form of protection while they delivered blows at the enemy. Vehicles constructed with a view to solving this problem were fore-runners of the tank. They were propelled by man or horse, and timber or leather was generally used to protect the crew. With the invention of gunpowder, it was found impossible to provide protection against the bullet: the great weight of armour protection required made impossible propulsion by man or horse.

Armoured Vehicles Proposed

At the beginning of the 20th century the invention of the caterpillar track and of the high speed internal combustion engine made it possible once more to use fighting vehicles on the battlefield. Several suggestions were made before the First Great War that tractors should be adapted to carry armour plate and weapons so as to produce fighting vehicles, but no official action was taken.

Contrary to expectations, the First Great War very soon developed into trench warfare, in which the defences, with their machine-guns protected by barbed wire obstacles, proved impregnable to attack except with the most prodigious loss of life. In Oct., 1914, an officer of the Royal Engineers, Lt.-Col. (later Maj.-Gen.) E. D. Swinton, who had suggested the development of some form of power-driven vehicle on caterpillar tracks and fitted with armour and weapons to assist in overcoming the power of the defence, explained his proposal to Col. Hankey, secretary of the committee of imperial defence, who put the idea before the prime

minister. Some trials were carried out, but little progress was made. The idea, however, reached Winston Churchill, who was first lord of the Admiralty and already experimenting with armoured cars for the naval force in Belgium. He took up the proposal with enthusiasm, and formed a committee under Sir Tennyson d'Eyncourt. At the same time, Lt.-Col. Swinton took his proposals to the c.-in-c. in France, with the result that a specification of the type of machine required was sent to the War office. The first machine constructed, called Little Willie (the popular nickname for the German crown prince, to distinguish him from his father, the emperor William II), just failed to meet the specification, but a slightly larger machine named Big Willie, completed a little later, passed all the tests. The design, prepared by Lt.-Col. W. G. Wilson, working in conjunction with Sir William Tritton, was the prototype of all British machines used in the First Great War. The ministry of Munitions formed a tank supply committee under Sir Albert Stern and a hundred tanks were ordered to this design.

The Mark I tank had a total length of 26 ft. and weighed 28 tons. There were two types, male and female. The male tank had two low velocity 6-pdr. guns and three Hotchkiss machine-guns. The female type had four Vickers machine-guns and one Hotchkiss. The tank was driven by a 100-h.p. Daimler engine and had a crew of eight men. The early models had a pair of wheels at the back to assist steering and to help in crossing wide trenches. These wheels were omitted in later models. In March, 1916, a unit, called for secrecy the heavy branch machine-gun corps, was formed under the command of Col. Swinton to man these tanks.

First Tank Attack

On Sept. 15, 1916, the first tank attack took place on the Somme, 50 tanks advancing in small packets in front of the infantry in the attack on the 4th army front. This form of attack came as a complete surprise to the Germans. In some cases, and notably at

Flers, marked success was achieved; but as a whole the result was disappointing. The tanks had been designed to cross rough ground and obstacles, but the continuous small craters and shell-torn ground which had resulted from weeks of heavy bombardment had rendered the terrain almost impassable. Small numbers of tanks were used on Sept. 25 and 26 and Nov. 13. On each occasion most of the tanks were unable to reach their objective, but those that did so rendered invaluable help to the infantry.

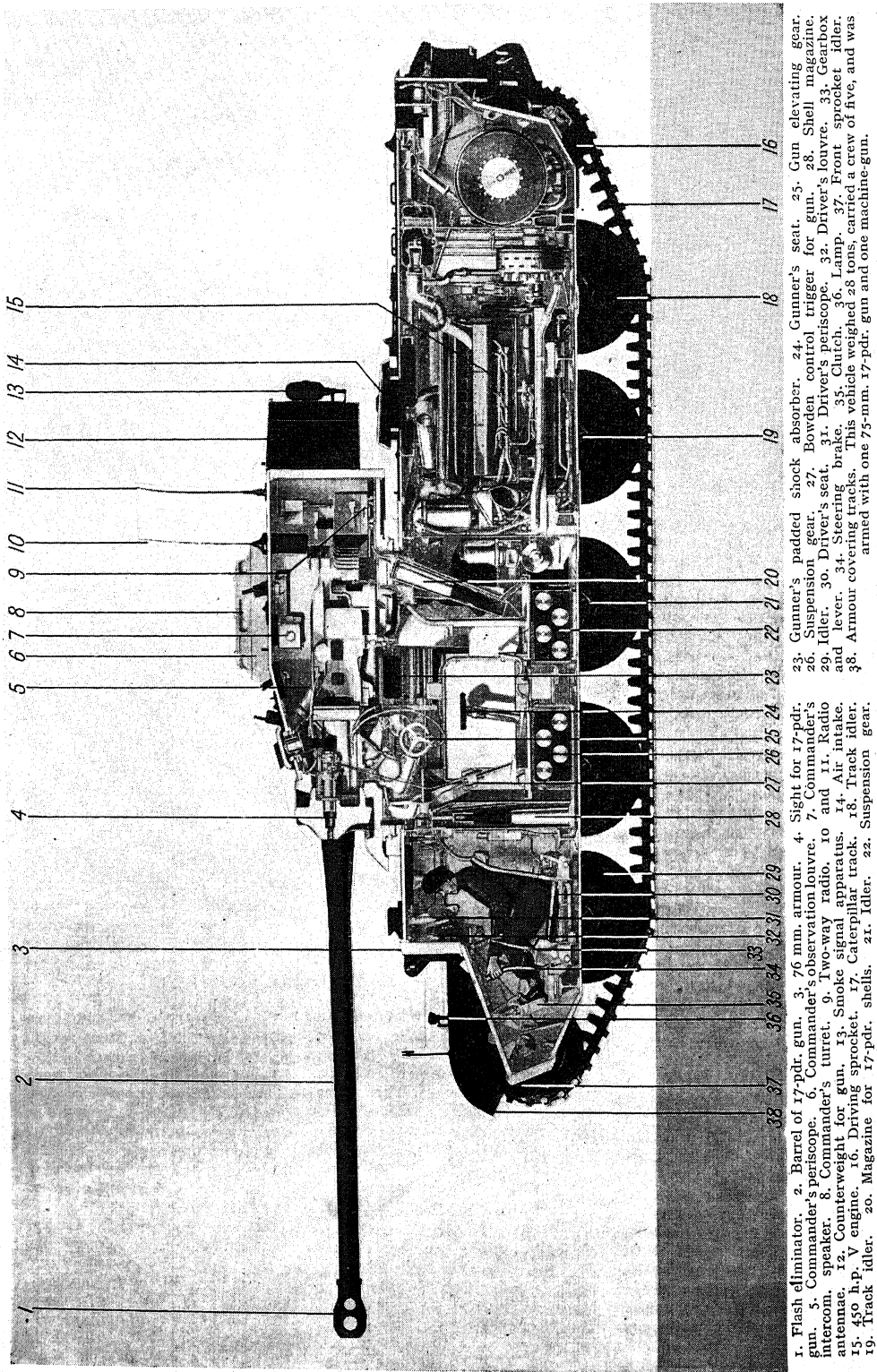
Views on the Use of Tanks

The use of tanks in Sept., 1916, was contrary to the views of those who had originated them. The originators considered that the tank should have been kept secret and used in large numbers as a surprise on a new portion of the front so as to give the chance of achieving a decisive success. The trial did, however, show that the tank was an answer to defence by machine-guns and barbed wire. It was decided to raise several tank bns. under the command of Col. H. J. Elles, and 1,000 tanks were ordered.

The Mark I tank had certain weak features and a crude system of steering, effected by changing the gear on each side of the tank. The ministry of Munitions produced a new model, but owing to delay by the general staff in approving it, production was continued of the existing type with minor improvements. These improved tanks were known as Marks II and III; they were provided with armour proof only against ordinary bullets. After the secret had been given away, it was assumed that the enemy would use armour-piercing ammunition, and the Mark IV tank was therefore made proof against every form of small arms fire.

In April, 1917, tanks were again used at the battle of Arras and in June at Messines. In both battles a heavy artillery bombardment was the main support for the infantry, the tanks being used in an auxiliary rôle. In July, the third battle of Ypres began. In this low-lying area, torn up by shell fire, tanks proved of little value.

The officers responsible for this new arm had been pressing for the use of tanks ahead of infantry in a surprise attack on a wide front without preliminary bombardment, which destroyed all chance of surprise. This proposal was finally approved and the battle of Cambrai was launched on Nov.



1. Flash eliminator. 2. Barrel of 17-pdr. gun. 3. 76 mm. armour. 4. Sight for 17-pdr. gun. 5. Commander's periscope. 6. Commander's observation loivre. 7. Commander's intercom. speaker. 8. Commander's turret. 9. Two-way radio. 10 and 11. Radio antennae. 12. Counterweight for gun. 13. Smoke signal apparatus. 14. Air intake. 15. 450 h.p. V engine. 16. Driving sprocket. 17. Caterpillar track. 18. Track idler. 19. Track idler. 20. Magazine for 17-pdr. shells. 21. Idler. 22. Suspension gear. 23. Gunner's padded shock absorber. 24. Gunner's seat. 25. Gun elevating gear. 26. Suspension gear. 27. Bowden control trigger for gun. 28. Shell magazine. 29. Idler. 30. Driver's seat. 31. Driver's periscope. 32. Driver's loivre. 33. Gearbox and lever. 34. Steering brake. 35. Clutching brake. 36. Lamp. 37. Front sprocket idler. 38. Armoured covering track. This vehicle was designed to carry a crew of five, and was armed with one 75-mm. 17-pdr. gun and one machine-gun.

TANK : SECTIONAL DIAGRAM SHOWING THE INTERIOR OF A BRITISH CROMWELL CRUISER TANK

20, 1917. This was the turning point in the history of the Tank corps. The attack was carried out by the 3rd army using the 3rd and 4th corps with a total of six divs.; nine tank bns. with 378 tanks and organized in three bdes. were used. At dawn tanks led the forces on the whole front, Gen. Elles advancing in the leading tank in the centre of the line. Complete success was achieved on the first day, the infantry advancing 5 m. on a 6-m. front, taking 8,000 prisoners, and inflicting heavy casualties. British casualties were less than 4,000. As a raid the operations had been perfect; but the Allies had not the resources to continue to press forward, and eventually the Germans delivered a successful counter-attack.

In March, 1918, the Germans delivered their great counter-offensive. The Tank corps was built up to five bdes. with a total of 13 bns. The Mark V tank, now introduced, had a more powerful engine and was far more manoeuvrable. The British Mark IV and V tanks took a leading part in all the concluding battles of the war, the Germans attributing their failure in the main to the part played by these tanks.

French Invention

The French invented a tank independently in the early stages of the First Great War, and when this was discovered the British and French authorities met together in June, 1916, to compare plans. The French went in chiefly for a small, light tank intended to keep the warfare mobile after a breakthrough, though they made some heavier tanks for trench warfare. The Renault light tank met with great success in the battle of Soissons, July 18, 1918, and in the subsequent Allied offensive. The British counterpart of this French tank was the Medium A (or whip-pet). When the U.S.A. entered the war, an Anglo-American design of heavy tank, Mark VIII, was produced. This was generally similar to the British Mark V tank, but longer, and it had a more powerful engine. Plans were in hand to produce very large numbers of this type if the war had continued into 1919. British tank corps h.q., formed Aug., 1916, initiated proposals for introducing large-scale mechanical warfare. Col. Elles was the commander, with Capt. Martel on the general staff.

After the First Great War, light and fast tanks, suitable for small scale colonial warfare, were produced. The first Vickers tank,

1921, weighed 12 tons and had a speed of 20 m.p.h. with an armament of one 3-pdr. gun and two machine-guns. It had a revolving turret, providing all-round fire.

As a result of discussions on the use of mechanical instead of manpower, the C.I.G.S., Gen. (later F.-M.) Milne, formed a mechanised force for trials on Salisbury plain. It consisted of a bn. of tanks, a mechanised artillery bde., and a machine-gun bn. carried in cross-country lorries, with engineer and signal units. Armoured cars and other small vehicles were used for reconnaissance. The idea was that such a formation, or a number of such formations working together, should be used in the mobile rôle carried out in the past by cavalry. Satisfactory field trials were made in 1927 and 1928.

In the meantime a new idea was introduced. The Vickers tank, though smaller than the war tank, was still a fairly large and expensive affair. At this period no nation was prepared to spend any great sums on equipping an army. The proposal was therefore made that quite small light tanks should be used in large numbers for this mobile rôle. The first model of such a tank was made privately by Major G. Le Q. Martel, who had initiated these ideas. These simple light tanks were to be supported by mechanised artillery and a limited strength in infantry carried in lorries. The machines made for this purpose were developed on two different lines. Along one line they became a very good, three-man light tank weighing 5 tons. On the other line they developed into the machine-gun carrier which eventually became the Bren carrier. These machines were developed by Sir John Carden, who joined Vickers. A new design for fighting, the 16-tonner, was prepared, but it was expensive, and only a few were ordered.

As an alternative to a mobile force of all arms, the all-armoured force, consisting almost entirely of tanks, was proposed in 1929; necessary artillery and infantry support was to be taken from normal formations when required. Trials and training on these lines were carried out during 1930-38. Great Britain developed a technique for the handling and control of these tank bdes. by the use of wireless telephone which was closely watched and copied by other nations.

Germany equipped large numbers of armoured formations with light tanks, and built a small

number of medium tanks. The Germans were also interested in the British all-armoured force, but after large-scale trials decided that this was a mistaken policy, and they were right. It was the universal experience during the Second Great War that an armoured formation intended for a mobile rôle had to be a properly balanced force of all arms.

Dual Rôle of Tanks

It was realized by Great Britain that, apart from light tanks for use in a mobile rôle, more powerful but slower tanks would be needed to assist the infantryman in close and heavy fighting. In 1935 the British therefore carried out trials with tanks which would have armour sufficiently thick to keep out shell fire as well as bullets. In 1936 Col. Martel, who was in charge of the tank dept. at the War office, visited Russia to see the manoeuvres there. The policy of having two types of tank for the two rôles was discussed with the Russians; complete agreement was reached and, except for a short period, both countries maintained this policy throughout the Second Great War. At the Russian manoeuvres was a tank designed by an American named Christie which had some very valuable features. Arrangements were at once made to incorporate these ideas in a British medium tank. In the Christie tank, thickness of armour and other features had been sacrificed to produce a spectacular performance. The whole tank had therefore to be redesigned to make it battleworthy, but many of its valuable features, particularly the type of suspension, were retained. The first pilot model of the new tank was completed in 1938. Large numbers were ordered; the tank was named the Crusader, and such tanks for mobile use became known as cruiser tanks. As there had not been time to carry out extensive tests and trials before production, a number of weak features of the Crusader came to light only later.

In the meantime work had been progressing on an infantry tank, the design for one called the Matilda being prepared in 1937. This had armour up to 90 mm. thick, and proof against the shells of the German 37-mm. anti-tank gun. It was armed with one 2-pdr. and one machine-gun. Speed and radius of action were reduced to enable the other features to be attained. The design proved remarkably successful for the first model of a tank incorporating entirely new ideas.

An armoured division was formed in Great Britain in 1938, but little training could be carried out for lack of cruiser tanks. A tank brigade was also formed equipped with Matilda tanks for cooperation with infantry. During the last year before the outbreak of the Second Great War in Sept., 1939, great efforts were made to raise additional armoured forces, but lack of equipment rendered this almost impossible.

Germany overwhelmed Poland with very superior forces, mostly armoured divs., equipped with light tanks, and backed up by motorized units. In the following spring, the German armoured forces met with similar success in France. The German adoption of the British proposals to equip and train armoured divs. with light tanks in peace time had paid. Great Britain, however, had never put her proposals into effect, and had virtually no armoured forces at her disposal. The Germans used a certain number of their Mark III and IV cruiser tanks to assist the light tank, and at the outbreak of war all German tank factories were turned on to the maximum output of this type of tank. At this stage the Germans had produced no heavy infantry tanks at all: they had pinned their faith on *blitzkrieg* methods, and slow infantry tanks could play no part in that type of warfare.

The French had built tanks which were a cross between the British infantry and cruiser tanks, but they had little understanding of the use of armour in defence, and failed to hold the forward sweep of the German armoured forces. During this German drive through France the British fought one small but important battle at Arras. In this battle the 1st British tank bde., equipped with Matilda infantry tanks and working with the 50th div., attacked German forces under the command of Rommel. The Matildas were immune to the fire of the German anti-tank guns, and for a time they dominated the battlefield. The value of this type of tank for close fighting was clearly proved. In the end the British were forced back by the great German superiority in strength; but the delay caused to the German advance was of great assistance to the evacuation from Dunkirk. The one and only armoured div. the British possessed was sent to France to assist the B.E.F., but it arrived only half equipped, and had no chance against the immense forces it met.

After Dunkirk the British had to start from nothing to build up their armoured forces. What little equipment they had was lost in France. A h.q. was established to raise the armoured forces required and to develop a technique for armoured warfare; Lt.-Gen. G. Le Q. Martel was appointed commander of the Royal Armoured corps. Two types of armoured forces were to be raised: the armoured div. using the faster type of tank for the mobile rôle, and the army tank bde. equipped with heavy infantry tanks to work with infantry in close fighting. By this time both the Germans and British considered that a proportion of infantry and artillery units was needed in the armoured div. The British armoured div. had two armoured bdes. and a support group of one infantry bn., one field regt. of artillery, one anti-tank and one A.A. regt., and two field squadrons of engineers. The armoured bde. had three armoured regts. each of three squadrons and a motor bn. The German Panzer div. was similarly organized. The British army tank bde. was organized in three armoured regts. or bns. At first five armoured divs. and eight army tank bdes. were raised; later these numbers were greatly increased. The technique for armoured warfare was built up by holding indoor and outdoor exercises and devising schemes.

British Policy Successful

In the defence of Egypt against the Italians, 1940-41, the British policy of using two types of tanks met with great success. At each stage the armoured div. advanced, felt for the enemy's flank, and attacked him in flank or rear, while the tank bn. with its heavier machines advanced more slowly and assisted in the attack on strong positions. The withdrawal of British forces to Greece, and the arrival in N. Africa of German armoured and mechanical forces under Rommel, made it possible for the Axis armies to drive the British back to the Egyptian frontier in the summer of 1941. The British tanks were then greatly handicapped by the fact that the Germans re-equipped their tanks in 1941 with a 50-mm. gun, replacing their 37-mm. gun; the new gun fired a 4½-pdr. shell. The British had prepared a new tank gun before the war which fired a 6-pdr. shell but it was a long time before this was manufactured and fitted to British tanks. The 50-mm. gun could penetrate the British cruiser tanks at 1,400 yds. whereas the

British, with their 2-pdr. gun, had to close to 800 yds. to penetrate the German tanks.

The weak mechanical features of the British cruiser tanks were eventually rectified, and they were equipped with 6-pdr. guns. The Cromwell, incorporating the best features of the Crusader, became the most reliable and successful cruiser tank used in the war. It mounted a 75-mm. medium velocity gun. The Churchill, an infantry tank, which had many mechanical failures for some months, eventually gave splendid service.

Armoured and Unarmoured Troops

At the end of 1941 British armoured forces, little superior in strength to those of the Axis and definitely inferior in gun power and in the reliability of their tanks, drove Rommel's forces back to Benghazi. Experience showed that the armoured div. needed a larger proportion of unarmoured troops, and it was now organized with one armoured bde., one infantry bde. carried in lorries, the former retaining the motor bn., and one armoured car regt. for reconnaissance; the divisional artillery contained two field regts., one anti-tank and an A.A. regt.; the divisional engineers had two field squadrons. This organization was retained till the end of the war and came to be accepted as standard, other nations also adopting it. The British made little alteration to their organization of the army tank brigade.

When the 8th army began to prepare for the battle of Alamein, it included armoured forces which arrived in the Middle East fully trained in the technique of armoured warfare, and equipped with reliable tanks mounting 6-pdr. guns. H.Q. armoured forces had always stated that it would need 18 months to reach this standard, and that time had now elapsed. From that moment British armoured divs. were consistently victorious. At the end of 1942 H.Q. armoured forces was abolished as having accomplished its task.

The technique which had been developed was as follows: While armoured divs. exist on one side, the commander on the other cannot move his normal formations freely. The first object of a commander will therefore often be the elimination of the opposing mobile armoured forces. This may take the form of a clash between the tank forces of the two sides; but if one side can use its armoured forces to seize ground which is vital to the opponent, it may force him

to attack on ground of its own choosing and thus be able to weaken or even destroy his armoured forces. The normal process is therefore for the armoured forces to advance and for the unarmoured troops to secure pivots of manoeuvre round which the armoured forces may operate. This process can be continued until a position is taken which the opposing commander must recapture. To do so without delay he must attack with his armoured forces, and this provides the opportunity for the destruction of these forces by the defensive action of the unarmoured troops combined with offensive action by the armoured troops.

Organization of Reconnaissance

Certain reconnaissances must be carried out in front of the advance of the armoured divs. All possible information must be obtained from the air. After that armoured cars drive ahead to carry out medium distance reconnaissance which gives early information of the movements and location of opposing forces. In the open desert no other form of reconnaissance was needed (other than battle reconnaissance), but in European country an advance guard was required to sweep aside minor opposition and to provide protection for the main body of the tanks. The h.q. of an armoured regt. usually runs this advanced guard, which consists of one or two squadrons of tanks and some infantry and artillery attached as required. In addition to this advance guard each armoured regt. has 18 small vehicles for close reconnaissance and intercommunication. Finally, there is battle reconnaissance. Before launching an armoured attack it is usually necessary to "tap in" with tanks to force the opponent to disclose his defensive lay-out.

The order in which an armoured div. advances depends on circumstances. If a rapid move is possible to secure some position and opposition during the move is unlikely, the motorised infantry bde. leads, as it moves more rapidly than the armoured bde., and can seize and secure the position at once. If the armoured div. is advancing through open and suitable tank country, and some opposition is expected, the armoured bde. leads so that any opposition can be overcome without delay. Having secured the objective, however, the armour must at once be relieved by the infantry bde., so that the tank crews can carry out the necessary maintenance work on their tanks

and then remain ready for armoured action. If the armoured div. has to move through enclosed country where opposition is likely, then it usually pays to let the infantry bde. take the lead, for tank units can move only slowly through country where anti-tank weapons can be easily concealed. Close co-operation with air forces is essential at every stage. When a tank attack is launched the maximum possible support must be given from artillery and the air.

AMERICAN TANKS. The U.S.A. adopted the policy of using only one type of tank, of which the chief example was the Grant, a very reliable machine halfway between the British cruiser and infantry tanks in mechanical performance, but defective because its guns had a limited traverse. This was put right in the Sherman, which gave splendid service in N. Africa. It was not as good, however, as the Cromwell in mobile warfare or the Churchill in close warfare.

SPECIAL TANKS. Special R.E. tanks were made to assist in overcoming the obstacles on the Normandy beaches. Devices mounted on Churchill tanks made it possible to place bridges over gaps and to overcome obstacles without exposing men to fire. Mortars to throw heavy charges were mounted on other tanks. Proposals for special R.E. tanks had been made towards the end of the First Great War and the prototypes of most of these devices were suggested and tried then. Special swimming tanks were also provided to assist in the landings.

A number of fighting tanks called kangaroos, fitted to carry a section of infantry behind bullet-proof armour, were used very effectively. (A similar tank made in 1918 was finished too late to be used in the First Great War.) A Churchill tank with flame thrower in the front was used with success for mopping up tanks and in street fighting in Europe, Asia, and the Pacific; the maximum range was just under 100 yds.

ANTI-TANK DEFENCE. The Germans did little to develop anti-tank defence during the First Great War. They used anti-tank mines in small numbers, and made a heavy anti-tank rifle, but neither was very effective. They trusted to field guns, dug in and carefully concealed in the forward area, which reserved their fire till the British tanks were within close range. They used as much

as 30 p.c. of their field artillery in this rôle and at times they caused heavy casualties to the tanks; but the loss in strength of artillery fire for the defensive barrage was a serious handicap.

Between the two Great Wars, anti-tank mines and rifles were developed and special high velocity anti-tank guns. The heavy anti-tank rifles proved of little value, but the mines were a very serious factor. The British engaged in research to discover methods of sweeping a way through mine-fields. Rollers and ploughs pushed in front of the tanks were tried with some success. Eventually the flail tank was evolved: chains on a revolving drum in front of the tank beat the ground like a flail and exploded the mines; this apparatus was used successfully in the later stages of the Second Great War. The early models of British infantry tanks of that war were proof against the shells of the existing German anti-tank guns; but a new anti-tank weapon was introduced, rocket propelled and firing a high explosive hollow charge. Easily carried and fired by infantrymen, it was very effective even against the most powerful tank at short range. This weapon, the British P.I.A.T. (*q.v.*), had an American counterpart in the bazooka (*q.v.*), and a German in the Panzerfaust. The Allies had less use for such weapons during the final stages of the war as they possessed a great superiority in tanks. At times tanks were used dug in, or standing behind a small rise in the ground, and waiting in defence for a tank attack. If opposing tanks can be lured on to attack stationary and semi-concealed tanks in this way heavy casualties may be inflicted on them. Tanks should not be used in this way, except temporarily during mobile warfare. For a more permanent defensive rôle, anti-tank guns must be used and the tanks kept mobile.

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Tanker. Ship designed to carry liquids in bulk. Since the 3rd cent. B.C. the Chinese have used 50-ton junks fitted with internal divisions for the carriage of oil and water. The first European tanker, a 500-ton sailing ship with tanks for whale oil, was built in 1795. Similar vessels were used in the mid-19th cent. for the coastwise transport of Scottish shale oil. Ocean-going tankers built at Newcastle-upon-Tyne in 1886 for importing American oil into Europe could carry 800 tons. In 1950 several tankers each of 28,000 deadweight tons were under construction in British shipyards, while four of 30,000 d.w.t. were then the largest built in the U.S.A.

To prevent the oil from surging and so threatening the stability of the ship, the free surface of the liquid cargo is broken up by partitions. All tankers are self-discharging; between the tanks are pumps to force the oil along continuous pipe-lines on either side of the ship and then by vertical pipes to deck level, where other pumps discharge it into shore storage tanks. Oil being subject to extreme variations in volume according to temp., to allow for expansion of the cargo the main tanks are connected to an additional tank space, which can receive the overflow. Tankers' propelling machinery is always installed aft; this reduces fire risk, leaves the maximum hull space available for cargo, and simplifies the lay-out of the pumping installation.

The ships seldom remain serviceable more than 10 years. This, and the fact that one cargo must pay the costs of the outward and homeward voyages, compel tankers to spend the maximum time at sea. They are seldom in port more than two days, for a cargo of 15,000 tons can be lifted or discharged in less than 24 hours. In 1949, the world's total deadweight tonnage of tankers over 500 gross registered tons was approx. 25 million (including under the U.S. flag 8.5 m.; British 5.8 m.; Norwegian 3 m.; Panama 2.3 m.).

Tankerton. Seaside resort of Kent, England. It is an E. extension of Whitstable (q.v.).

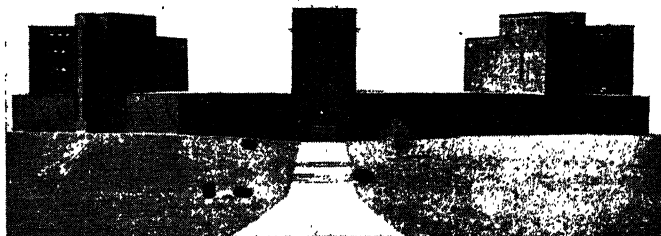
Tankerville, EARL OF. British title borne by the family of Bennet since 1714, and before then by the family of Grey. In 1695 Forde Grey of Werk, Northumberland, was created earl. He had no sons, but a daughter Mary married Charles Bennet, Baron

Ossulston, a title dating from 1682. The earl died in 1701, and his son-in-law was made earl of Tankerville in 1714. From him the line is descended. Charles, 6th earl (1810-99), was M.P. for N. Northumberland, 1832-59, and lord steward, 1867-68. Charles, 8th earl, was born Aug. 16, 1897, and in 1931 succeeded his father. The earl's eldest son is known as Lord Ossulston.

Tannenberg (Pol. Stebark). Village of Poland, until 1945 in the German prov. of E. Prussia. About 75 m. S. of Kaliningrad (Königsberg), it was the scene of a victory of Lithuanians and Poles over the Teutonic knights in 1410, and of a Russian defeat by Hindenburg

of taking command, Hindenburg established himself on the rly. and road from Osterode to the frontier, Soldau being retaken by him on Aug. 26. When next day Samsonov tried hard to recapture it, he was swept back E. to Neidenburg, thus having his left flank turned, and losing his main line of supply and retreat by the Soldau-Mlava rly. Evacuating Allenstein, the Russians retired on Hohenstein, where they made a determined stand, the fighting lasting from the 26th to 28th, but they were compelled to retreat.

Hindenburg extended his left flank far beyond Allenstein, with a view to turning the Russian right, and at the same time driving



Tannenberg, Poland. The German memorial, erected on the battlefield at Tannenberg, to commemorate Hindenburg's defeat of the Russians in 1914

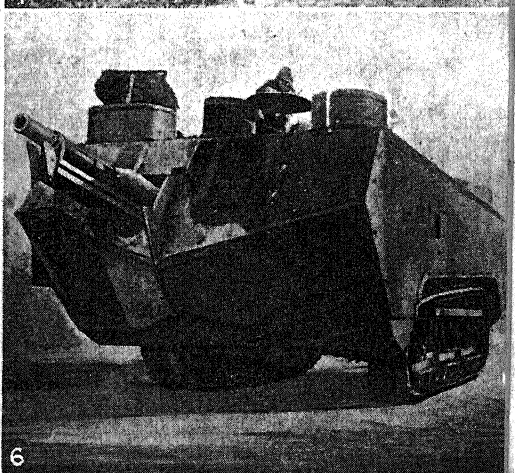
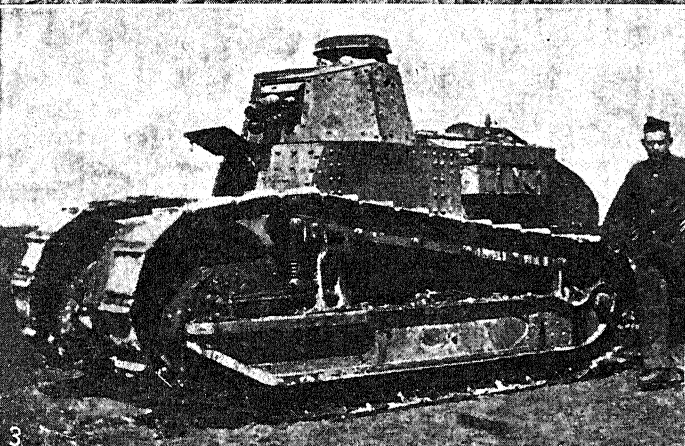
in 1914 (v.i.). To commemorate the latter victory the Germans erected a memorial on the battlefield, and held a military parade on each anniversary. Hindenburg was buried here. In the Second Great War troops of the 2nd White Russian army occupied Tannenberg on Jan. 21, 1945.

Tannenberg, BATTLE OF. German victory over the Russians, Aug. 25-31, 1914. After their defeat of Aug. 24, 1914, the Germans fell back on Osterode, where large forces were being concentrated, consisting of about 160,000 men, under Hindenburg. The Russians, under Samsonov, were at least 50,000 men stronger.

Hindenburg took up his quarters at Marienburg on Aug. 23, with Ludendorff as chief of staff. His problem was to drive the Russians out of E. Prussia, in which he had Rennenkampf's army as well as Samsonov's to face and defeat. His first move was against the latter. He quickly got his forces into position on a front that reached from Osterode on the N. to a point near Soldau on the S. Thrusting towards the former, the Russians discovered that the Germans had been strengthened, and were not to be driven out. Within three days

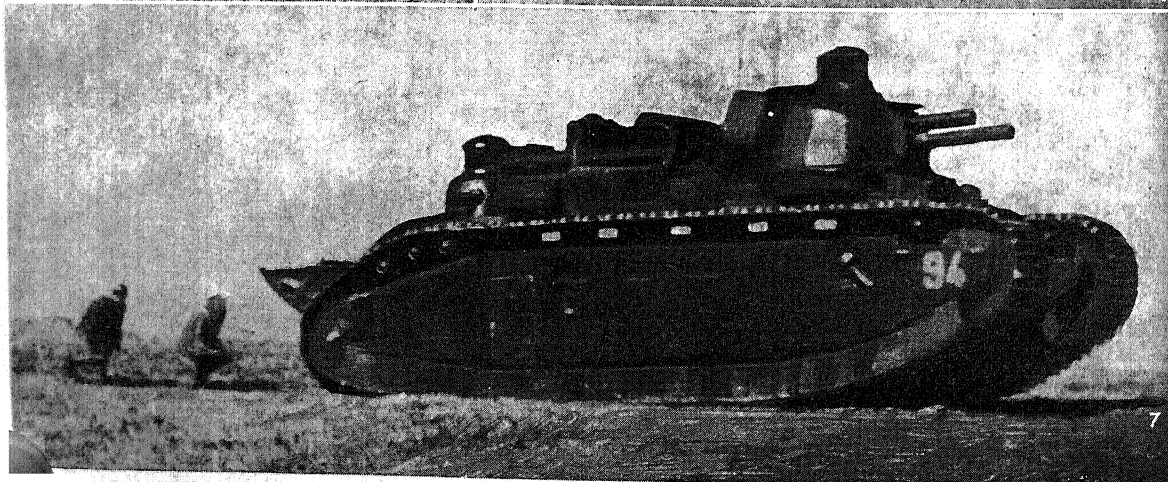
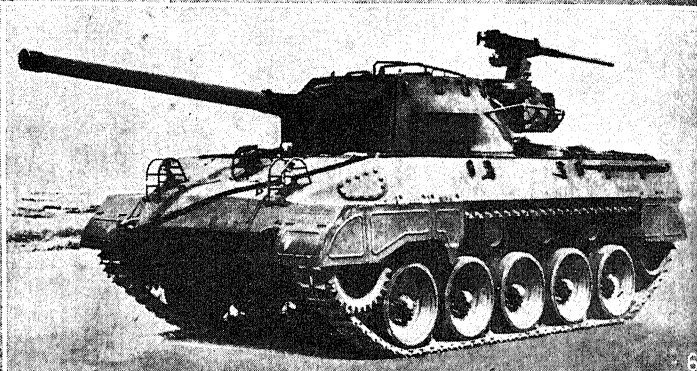
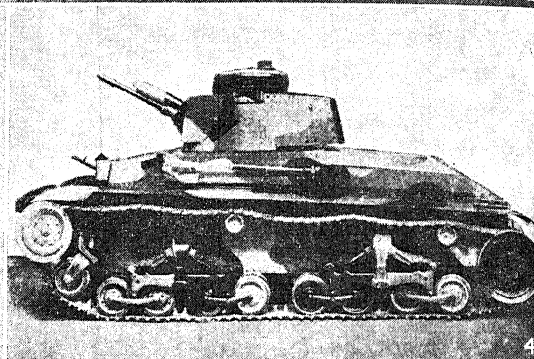
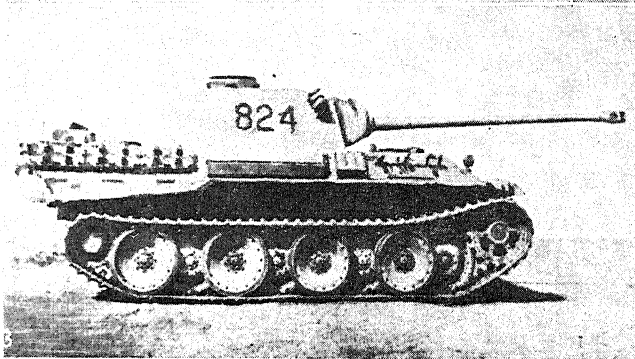
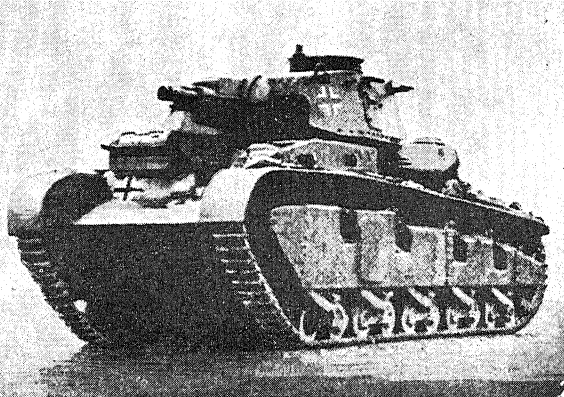
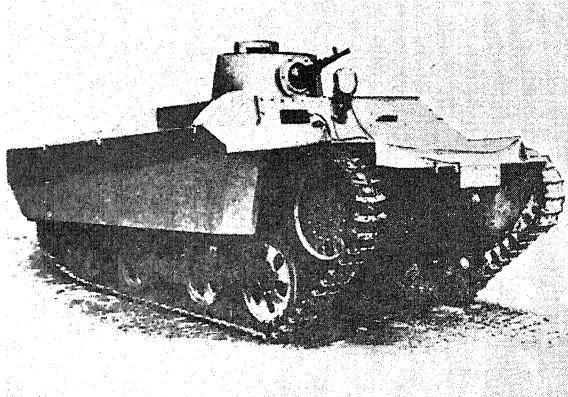
in a wedge between it and Rennenkampf's army on the N. This move succeeded. Having taken Wartenburg on the rly., the Germans of this wing marched on to Passenheim, which they captured on Aug. 29. The Russians then were surrounded on the W., N., and E., and Hindenburg's heavy guns played havoc among them. Their only way of retreat was by the S., over a tract of lake and marsh, which was crossed by a narrow defile of firm ground by Ortelsburg and Johannsburg to the frontier. By the 30th the Russians were withdrawing everywhere, losing many men and guns in the swamps and shallow miry lakes. Hindenburg's knowledge of the terrain enabled him to place his guns on solid spots, and the Russians were mercilessly shelled.

On Aug. 31 Samsonov made a last desperate attempt to rally his men, but he and his chief of staff were killed, and the effort came to nothing. Only about 60,000 men escaped across the frontier into Russia. In this battle the Germans took 90,000 prisoners, and captured hundreds of guns. This victory ranks among the most decisive of the First Great War. *Consult* My Life, P. von Hindenburg, 1920.



1. British Mark I "Male" tank armed with 6 pdr. guns on the Somme battlefield, 1916, the first type of tank ever used in action. 2. German tank captured at Bapaume, Aug., 1918. 3. French light reconnaissance and pursuit tank of 1918. 4. British light tank introduced in Jan., 1918. 5. British Mark IV tank at Cambrai, Nov., 1917. 6. Heavy French tank of 1918, with Renault engine, and armed with one 75 mm. gun and two machine-guns

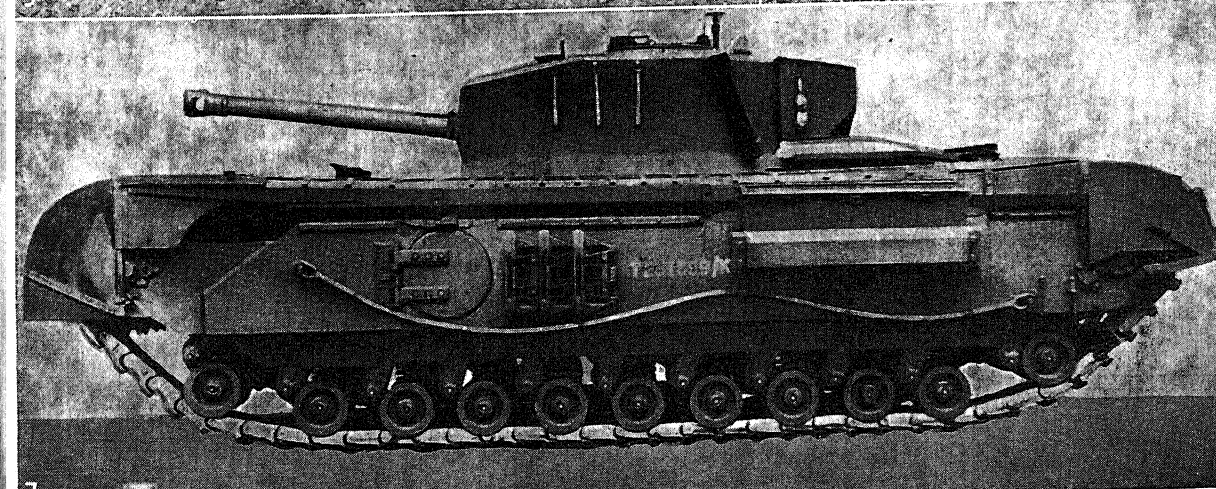
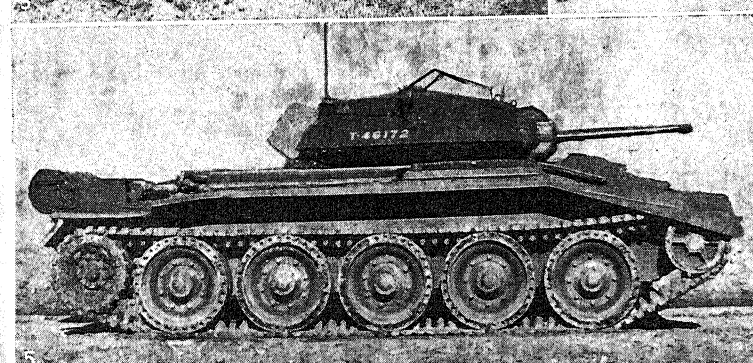
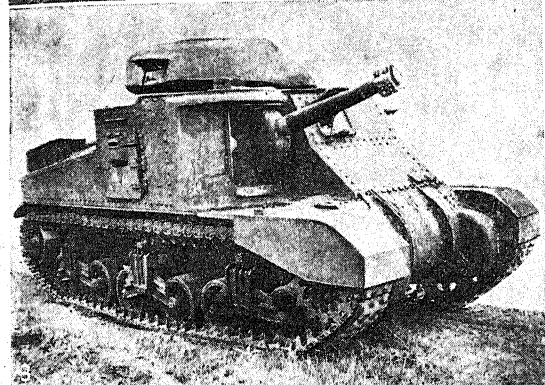
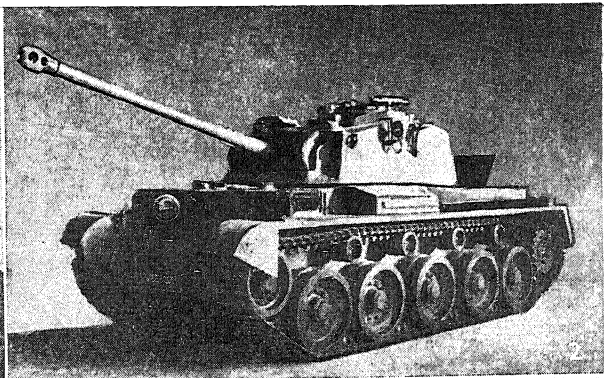
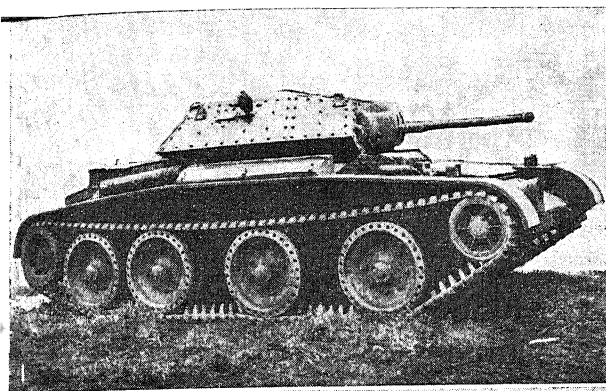
TANKS: ALLIED AND GERMAN FIGHTING VEHICLES OF THE FIRST GREAT WAR



1. Czech light amphibious tank (1939). 2. German 35-ton cruiser tank used in the invasion of France, 1940. 3. German 45-ton Panther tank introduced in 1943. 4. Czech infantry tank of 1939. 5. German machine-gun carrier for reconnaissance work (1945). 6. U.S. Helicat tank destroyer of 1944, armed with one 55 mm. gun and a .5 A.A. gun. 7. French 60-ton assault tank operating on Saar frontier, 1939, armed with one short-barrelled 75 mm. gun

TANKS: TYPES USED BY GERMANY AND THE ALLIES, 1939-45

Photos: 3, Photographie News Agencies; 5, Pictorial Press; 6, Keystone; 7, Associated Press

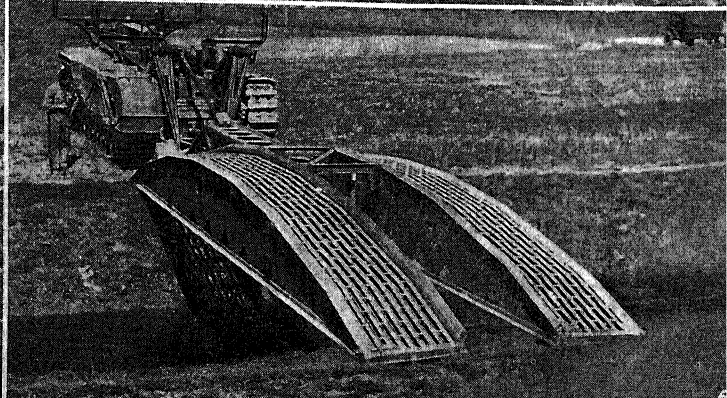
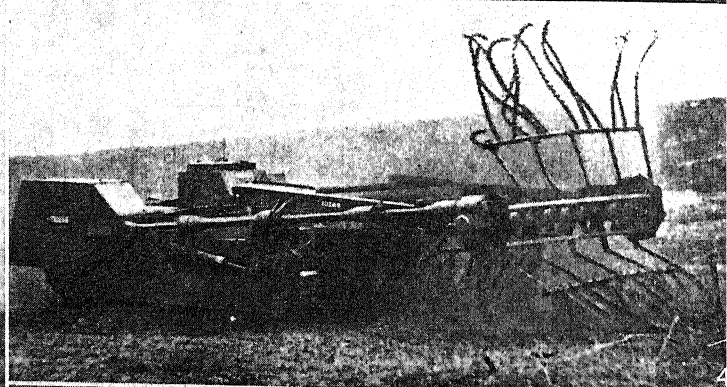
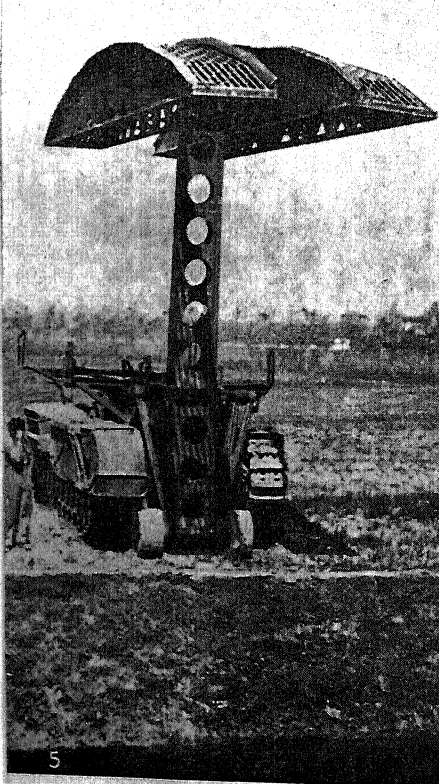
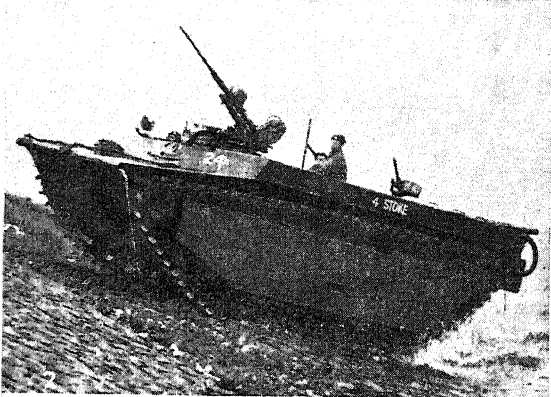


1. British Crusader Mark V medium cruiser tank, as used in N. Africa. 2. British Comet tank, introduced at end of Second Great War. 3. U.S. light infantry tank employed

in 1942. 4. British Centaur tank of 1944. 5. British Crusader Mark VI cruiser tank. 6. Whippet tank used by the B.E.F. in France, 1939-40. 7. Churchill tank Mark VII

TANKS: BRITISH AND U.S. TANKS OF THE SECOND GREAT WAR

Photos: 1, 4, 5, British Official; 2, 6, Fox Photos; 3, Associated Press; 7, Vauxhall Motors



1. Crocodile flame-throwing tank, Western Front, Nov., 1944. 2. Amphibious Buffalo troop and store carrying tank at Beveland, Oct., 1945. 3. U.S. Sherman tank armed with sixty 4.5-in. rocket projectors, Western Front, March, 1945. 4. Churchill flail tank clearing minefields,

Normandy, July, 1944. 5. Churchill 38-ton "scissors" tank for bridging small rivers and canals, introduced 1944; the hydraulic ram is seen lifting "scissors" bridge preparatory to placing it in position. 6. Churchill "scissors" tank placing a double-ramp bridge across a narrow stream

Tannhäuser. Hero of a medieval German legend, whose story has been described as symbolising the hankering after old heathenism and the protest against the harshness of the Christian clergy. He visits the Venusberg (*q.v.*), and afterwards seeks pardon of the pope, who declares that he will never be forgiven unless the staff he holds breaks into blossom. Tannhäuser returns to the sensual fascinations of the Venusberg, and after his departure the pope's staff blossoms. He was popularly identified with a 13th century minnesinger of that name, who wandered about Germany and composed erotic poems, some of which are extant. Wagner used the story in his opera, *Tannhäuser*, 1845.

Tannin OR **TANNIC ACID.** Astringent substance obtained from galls and known also as digallic acid. The name is also applied to a series of plant constituents which possess the properties associated with tannic acid, viz. tanning animal skins, possessing an astringent taste, and giving black-blue or dark green compounds with iron salts.

The best known form of tannic acid is obtained from nut-galls, of which there are two varieties, the ordinary Turkish or Levant kind, produced by the puncture of the gall-fly in the young shoots of a kind of oak tree, and the Japanese or Chinese variety, produced by a plant louse on the leaves and leaf stalks of *Rhus semialata*. Galls contain from 60 to 80 p.c. of tannin, which is separated by digesting powdered gall-nuts with ether containing a small proportion of alcohol and water. The liquid is then filtered through cotton-wool and separates into two layers, the upper one containing gallic acid and colouring matter, and the lower layer consisting of a solution of tannic acid, which is separated and evaporated to dryness.

Tannic acid is a light yellowish powder, with a characteristic odour, acid reaction, and astringent taste. It is soluble in water, alcohol, and glycerine. The salts of tannic acid are known as tannates. The acid is used in medicine as an astringent, many substances containing it being also valued because of the astringency which the particular form of tannin possesses. The use of solutions of tannic acid in the local treatment of burns was introduced in 1925 and became the standard remedy for some years. Application resulted in the formation of a scab which protected the skin from pain, diminished the loss of fluid, and prevented the ab-

sorption of toxic substances. Tannic acid is used for making ink and clarifying wine and beer, while many substances containing it, e.g. oak bark, sumach, divi-divi, and myrobalans, are used in making leather. Tannin is present in long-brewed tea and is a frequent cause of dyspepsia in tea-drinkers.

Tanning. Preparation of natural skins and their conversion into leather. It is carried out chiefly by vegetable tanning, chrome tanning, alum tanning, and oil tanning or chamoising. The first depends upon the use of tannin, the second on chromium compounds, the third on alum, and the last on an oil which produces the well-known chamois leather. *See* Leather.

Tansa. Small river of India, in Salsette Island, Bombay prov. It is 60 m. N.E. of Bombay city, and a large dam built in 1892 has turned the valley into a reservoir which supplies the city.

Tansillo, LUIGI (1510-68). Italian poet and soldier. He was born at Venosa in Lucania, and served with distinction under the viceroy of Naples, Don Pedro de Toledo, against the Turks, and also in Charles V's expedition against Tunis. Later he became a judge at Gaeta, and won fame by his lyrics and satirical writings. His work, *Il Vendemmiatore* (The Grape Gatherer), 1534, owing to its improprieties, incurred the condemnation of the Inquisition, but by way of amendment he began an epic, *The Tears of S. Peter*, 1539, which caused his name to be removed from the Index. Author of many fine lyrics, he is especially notable for two prophetic sonnets on the sensation of flying.

Tansy (*Tanacetum vulgare*). Perennial strong-scented herb of the family Compositae. It is a native of Europe, Siberia, and N.W. America. It has grooved, angular, leafy stems about 3 ft. in height. The large leaves are deeply cut from the edges feather-wise, and are fragrant when touched, and the dull yellow flower-heads are grouped in large flat clusters. Tansy was formerly much used as a domestic tonic and vermifuge, and also as a flavouring in cookery and to garnish dishes.

Tanta OR **TANTAH.** Chief town of the division of Gharbia in Egypt. It is an important rly. junction between Alexandria and Cairo, being 75 m. S.E. from the former. Three large animal fairs have been held here in Jan., April, and Aug. Pop. 139,816.

Tantalite. Ore mineral of tantalum (*v.i.*), iron manganese tantalate; end member of the columbite-tantalite isomorphous series, which ranges from columbite, $(\text{FeMn})\text{Nb}_2\text{O}_6$, to tantalite, $(\text{FeMn})\text{Ta}_2\text{O}_6$. The percentage of iron and manganese are also variable, manganotantalite being a deep translucent red, while ferrotantalite is black and opaque. The mineral occurs as masses or crystals in pegmatitic dikes or in association with veins of tin and tungsten; also in associated residual deposits. The principal sources are in Western Australia and the Belgian Congo; it is also found in Uganda, S.W. Africa, and Brazil.

Tantallon Castle. Ruined building of East Lothian, Scotland. It stands 3 m. E. of North Berwick, and almost due S. of Bass Rock. Built probably in the 14th century, it was a stronghold of the Douglases. It withstood attack by James V in 1528, but was captured and partially destroyed by the Covenanters in 1639. Twenty years later it sustained further damage at the hands of Monk. The castle was the birthplace of Gawin Douglas, and is described by Scott in *Marmion*. *See* North Berwick.

Tantalum. One of the metallic elements. Its chemical symbol is Ta; atomic number 73; atomic weight 180.88; specific gravity 16.6; melting point $2,850^\circ\text{C}$. It was discovered in Sweden in 1802 by Ekeberg, who suggested the name tantalum from the Greek Tantalus, since the substance "when placed in the midst of acids is incapable of taking any of them up." The element is most commonly found in conjunction with niobium in tantalite (*v.s.*). Other tantalum minerals



Tansy. Leaves and flowers of this strong-scented herb

are microlite and samarskite. It is commonly associated with tin, particularly in pegmatitic veins and dikes.

The commercial method of extracting niobium and tantalum is by fusion with caustic soda; after acid extraction the niobic and tantalic acids are dissolved in hydrofluoric acid. Sufficient potassium fluoride is then added to produce $K_2NiOF_5 \cdot H_2O$ and K_2TaF_7 , which may be separated by fractional crystallisation. The pure metal is made by the electrolysis of fused K_2TaF_7 to which some Ta_2O_5 is added. The powder thus obtained is processed by heating in a vacuum. The pure metal is very ductile, possesses great toughness, and has a high tensile strength.

Tantalum forms two oxides, reacts directly with the halogens (except iodine) and also with nitrogen and sulphur. When heated with carbon at $2,200^\circ C$. tantalum carbide (TaC) is formed, and this is nearly as hard as diamond and is very refractory. It is used for cutting tools and wire dies. One of the earliest uses of the metal was as a replacement for the carbon filament in incandescent lamps, but it has now itself been replaced by tungsten. Its addition to steel increases the hardness, and when alloyed with tungsten and other metals it gives very hard cast alloys which can be used for dies and cutting. Owing to the chemical inertness of the metal it is sometimes used, either by itself or as tantalum covered steel, for chemical plant, e.g. for hydrochloric acid production.

Tantalus. In Greek mythology, son of Zeus and father of Pelops. He was a favourite of the gods, but betrayed the confidence reposed in him by divulging the secrets of Zeus. For this he was punished by being condemned to stand in Hades with water all round him and rich fruits above his head; both receded whenever he tried to drink the water or reach the fruit. Another legend was to the effect that his crime consisted in killing his own son Pelops and setting his flesh before the gods to eat at a banquet. From Tantalus is derived the English word tantalise. A lockable stand for spirit bottles is called a *tantalus*.

Tantra (Skt., web). Indian religious book. Partly derived from, partly independent of, the Puranas, the titles of 64 Tantras are recorded, but few have been

identified. They usually comprise dialogues between Siva and his *sakti* or female counterpart, worshipped especially as Mahadevi, Kali, or Durga. Like the Puranas, they professedly treat of the world's creation and destruction, divine worship, the attainment of supernatural powers, and final union with the Supreme. The Saktas, who worship the female energy in divine manifestations, comprise those of the right hand, Dakshinacharis, whose ritual is open, and Puranic, and those of the left hand, whose ritual is secret and Tantric. The mystical and magical elements in these textbooks, derived from early paganism, pervade much modern Hindu practice, sometimes leading to gross licentiousness.

Tantum Ergo. Name applied to the two last verses of the Latin hymn Pange Lingua. The opening lines of these verses are:

Tantum ergo Sacramentum
Veneremur cernui;

translated as:

Down in adoration falling,
Lo! the Sacred Host we hail.

The *Tantum ergo* is sung in the R.C. Church at the service of Benediction (*q.v.*) and immediately precedes the actual benediction of the congregation.

Taoism. One of the great doctrinal systems of China. Its earliest explicit presentation occurs in the Tao-Teh King, the Canon of Reason and Virtue. This introspective treatise of about 5,000 characters is traditionally ascribed to the sage Lao-tse. Some Western scholars hold that he wrote nothing, but that his teaching was handed down and in part embodied in the King, three or four centuries after his death. About 150 B.C. the canon became, by imperial decree, a school classic.

Lao-tse taught that the universe is based upon a formative principle, Tao—the Way—whence all reality, Teh, is derived. This metaphysical idea of a First Cause, lacking personality, or consciousness, was vaguely current before his day, but owed its coherence to his teaching, which is a philosophy rather than a religion. Other early writers of a Taoist cast were Lieh-tse, Han Fei, and Hwainan-tse. The most brilliant was Chwang-tse, 4th cent. B.C., who brought Taoism into line with orthodoxy by regarding Tien, Heaven, as the First Cause, and Tao as the divine manifestation.

Already before our era there was engrafted upon the old speculative Taoism a mass of superstition,

derived partly from primitive shamanism, partly from the alchemy—with its search for the elixir and the philosopher's stone—which reached China through Hellenistic Bactria. Of this later Taoism Chang Tao-ling, a sorcerer of the 1st century A.D., is regarded as the first exponent. From him are reputed to have descended the line, numbering 62 in all, of so-called Taoist popes. About the same time Buddhism began to pervade China, and its growing activity led the Taoist priesthood of the 2nd century to absorb much of its organization and ritual, and to copy its monasteries and temples. These are distinguishable from Buddhist shrines by the images of the Taoist Trinity, Lao-tse, P'an-ku, the uncreated Adam, and Shang-Ti, the Pearly Emperor. The trend of Confucianism being ethical, the grosser elements of belief, indigenous and imported, found refuge in Taoism, which as a consequence became little more than a medley of primitive superstitions. See China; Confucius; Lao-tse.

Tap. Term used by engineers for a tool for cutting an internal thread, as in a nut. It comprises a hardened steel male screw having long grooves to provide cutting edges, and a square head for engagement by a wrench or its equivalent, by which the tap is rotated. In tapping a hole by hand, more than one tap is commonly used, e.g. a taper tap, a plug tap, and a bottoming tap in the order given. Hand tapping is used only for small or occasional jobs. Screwing machines are used extensively, with a single tap which cuts a finished thread in one operation. Internal threads are also cut on a lathe or a special machine of a similar kind adapted for this purpose. (See Screw.)

A tap is also a faucet or cock; a plug to open or close an opening in a cask or vessel; and the quantity of molten metal run out from a cupola at any one time. The drawing of latex from *Hevea brasiliensis*, and of sugar from the maple, is also termed tapping. See Rubber Sugar.

Tapajos. River of Brazil, affluent to the Amazon. From its headstreams, the Arinos and Juruena, in Matto Grosso, it flows in general N.N.E. to join the Amazon near Santarem after a course of 1,150 m. Its upper course is obstructed by rapids, and near the mouth it forms a lake expansion 70 m. long by 12 m. wide. It is navigable for the lower 200 m.

Tap Dancing. Form of dancing consisting of tapping rhythms with the feet, with or without music. The dancer's hips, ankles, and knees must be flexed, the arms relaxed, and the body moved in rhythm with the feet.

The tap itself is a short, sharp movement of the foot from the ankle, making one sound and finishing off the floor. There are six taps: the forward, a sharp beat with the ball of the foot in the forward direction; the back, a similar beat in the back direction; the straight, in which the foot is raised slightly, striking the ground vertically; the toe, in which the toe strikes the ground sharply to the rear; the heel, when the ball of the foot remains on the ground with the heel raised, then the heel strikes the ground sharply; the ball, with the heel on the ground and the toe raised, the ground being struck sharply with the ball of the foot. All these taps finish off the floor by lifting the foot after the tap.

The three beats in tap dancing are toe, heel, and ball; these are the same as taps but finish on the floor. Of the various movements the principal are: the hop, a spring on one foot; the spring, or jump from one foot to the other; the jump, a spring on both feet; the step, transference of the weight of the body from the heel to the ball of the foot; the walk, transference of the weight of the body from the heel to the flat of the foot; the brush, a forward or backward movement, similar to the forward or back tap, but made from the hip and knee instead of from the ankle; the skuff, a stamp of the foot carried forward and finished off the floor; the stomp, the foot pushed forward on the ball and the movement finished with a heel beat; the skuffle, forward-back tap to a count of less than two; the flap, a forward tap culminating in a relaxed step; the plain pick-up, with the heel on the floor, the toe being slapped sharply to the rear; the pick-up step, with the heel on the floor, the toe being jerked sharply backwards to complete a step to the rear; pick-up hop, a plain pick-up followed by a hop; pick-up spring, a plain pick-up followed by a spring; pick-up on one foot, a series of plain pick-ups on the same foot; pick-up change, series of plain pick-ups on alternate feet; pull-back, series of pick-ups on both feet simultaneously; ball and heel digs, pick-up foot, the floor being struck sharply

with either heel or ball; ball change, transfer of the weight of body from ball of one foot to ball of another; wing, a hop, but at same time a slide outwards on foot during the jump and a beat back on the inside of feet when returning to floor.

All tap-dancing consists of various combinations of taps, beats, and steps, and apart from its expression and spectacle as an art, provides valuable exercise for the leg and foot muscles.

Cherry Marsh

Tape Machine. This special form of telegraphic instrument is described under Telegraphy.

Tapestry. Hand-made fabric of ribbed surface, in which a picture or design is woven by weft threads passing alternately before and behind warpstrings, which become completely hidden by the process. It may be woven upon an upright loom or *haute lisse*, or upon a horizontal loom or *basse lisse*, but the resulting fabric is the same.

Tapestry-weaving is but a step removed from simple shuttle-weaving, and in its rudest form was practised by many primitive races. In Egypt it was in a high state of excellence about 14 centuries B.C., as may be seen from some dated examples in the Cairo Museum. Beautiful fragments in the Hermitage, Leningrad, show the high standard of Greek weaving nearly 1,000 years later. Tapestry was not only used as interior decoration, but on ceremonial occasions it was displayed in the streets. It illustrated all kinds of subjects—sacred, historical, legendary, and sporting.

In the 14th century London, Paris, and Arras were the three great centres of tapestry production. A fine series of tapestries from the Paris workshops, representing the visions of the Apocalypse, still exists in Angers cathedral. The workshops of Arras, thanks to the patronage of the dukes of Burgundy, achieved such fame that the name of the town became a synonym for tapestry. Prosperity declined about the middle of the 15th century, and in 1477 it was extinguished on the eviction of the inhabitants by Louis XI. Many weavers had gone to Italy and other countries, and the fame of Arras was inherited by Brussels. The quantity of precious tapestries in wool, silk, and gold produced there seems almost incredible. The famous tapestries after Raphael's cartoons of the Acts of the Apostles were woven in Brussels.

Besides Brussels, many Netherlandish towns, such as Oudenarde, Antwerp, and Enghien, were famous for tapestries. During the 17th century the output increased, but the quality deteriorated, while the best weavers were enticed away to work in foreign countries. A few workshops lasted until the 18th century, but the last closed down in Brussels in 1794.

During the 17th century several great factories were established. There had existed at Barcheston, Warwickshire, a weaving establishment to which we owe the Tapestry Maps at York and elsewhere, and in 1619 James I, inspired by the success of Flemish workshops instituted in Paris by Henry IV, procured many weavers from the Netherlands and set them to work at Mortlake under the direction of Sir Francis Crane. The chief series of tapestries woven there were Vulcan and Venus, the Acts of the Apostles, Hero and Leander, and Children Playing.

In 1662 Louis XIV consolidated the various royal tapestry workshops in Paris and lodged them in the Gobelins, a building belonging to the descendants of a famous family of dyers of that name. The excellence of the work produced caused the word Gobelin to become a synonym for tapestry on the Continent. Tapestry-weaving at the Gobelins has always been under state management, and the output is the property of the state. Instituted a little later than the Gobelins, the national factories at Beauvais and Aubusson had the additional privilege of selling tapestries, and the pastoral subjects by Boucher with the magnificent furniture coverings show Beauvais tapestry at its best. The horizontal loom is now exclusively used at Beauvais, the upright loom at the Gobelins.

Much might be written of the 18th century factories in Spain, Italy, and England. The last were mostly offshoots of the Mortlake factory, e.g. at Lambeth. At Soho John Vanderbank made a speciality of Chinese scenes. On looms set up at Merton Abbey in 1880 William Morris carried out several sets of tapestry after designs by Burne-Jones and others. See Bayeux Tapestry colour plate; Gobelin.

W. G. Thomson

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Thomson, 1915; The Spanish Royal Tapestries, Calvert, 1921; French Tapestry, ed. A. Lejard, 1947.

Tapeworm. Parasite widely distributed throughout the animal kingdom, found in the adult stage in vertebrates. The common species (*Taenia solium*), attacking man, is a long chain of oblong joints produced by budding from the "head," which is at the narrow extremity, attached to its host by suckers and hooks. See Cestodes.

Tapioca (*Manihot utilisima*). Perennial herb of the family Euphorbiaceae, a native of S.



Tapioca. Palm-like leaves and clusters of flowers of the herb which yields tapioca

America. It has a thick, fleshy, spindle-shaped rootstock, from which arise knotted stems bearing alternate leaves which are deeply divided, finger-fashion, into seven lance-shaped lobes. It has yellowish flowers; the sexes are separate. The root is the important part of the plant, but its flesh is permeated with a bitter, highly poisonous juice, which is got rid of by grating the flesh and pressing it into cakes, which are subjected to heat. The expressed juice also deposits much starch, which is dried on hot plates and becomes the tapioca of commerce. The juice is also concentrated by evaporation and boiling to form cassareep, used as a sauce and meat preservative.

Tapir (*Tapirus*). Genus of odd-toed ungulate mammals. They are natives of S. and Central America, the Malay Peninsula, Java, Borneo, and Sumatra. The nose and upper lip are united to form a short, movable trunk, and there are four toes on the front and three on the hind feet. The thick skin is entirely covered with hair, usually of a brownish-black tint, but in the young spotted or striped with white. The Malayan tapir has a broad band of white around the centre of the body. Tapirs are all vegetarians, and are one of the oldest existing types

of mammal, their remains being found in the Miocene deposits of Europe and more abundantly in the Pliocene. See Ice Age.

Tapiro. Tribe of negrito pygmies on the S. Nassau slopes in the heart of Netherlands New Guinea. Discovered in 1910 by Rawling, they are woolly-haired, straight-nosed, and yellowish in colour. They wear rough bone or shell necklaces, bone nose-sticks, and plaited bags, hunt forest game with nooses and arrows, and use flint knives and bone daggers. Their pile-dwellings betray Melanesian contact.

Tapley, MARK. Character in Dickens's novel *Martin Chuzzlewit*. A jovial young ostler, he accompanies Martin Chuzzlewit as his servant to America, where he nurses him through an illness and has ample opportunity of living up to his great aim in life, of being "jolly" in adverse circumstances, sometimes to the point of weariness in the reader. His name has become a synonym for a cheerful, determined optimist.

Taplow. A village of Bucks, England. It stands on the Thames, 4 m. by rly. W. Slough. Across the river is Maidenhead. The church has some old brasses. Taplow is a popular boating centre, and has paper mills. Taplow Court, once the seat of the soldier earl of Orkney (1666-1737), passed into the possession of Lord Desborough. Pop. 1,031.

Taplow Terrace. In geology, a well marked terrace in the Thames valley, about 50 ft. above the river level at Taplow. It gives rise to the levels of Hyde Park and Kensington Gardens and many of the London commons. Its gravels have yielded Palaeolithic implements and fossils of mammoth, musk ox, rhinoceros, etc.



Tapir. The Malayan species of this mammal with its young

Tappet. Engineering term signifying a projection from a moving shaft which strikes some other moving piece periodically. In motor construction it stands for a short shaft between the foot of a valve and a cam on the cam-shaft operating the valves.

Tapping. In surgery, an operation resorted to in order to remove dangerous accumulations of fluid. It is chiefly used when fluid has collected in the pleura or peritoneum. The operation is performed by putting one end of a small tube in the cavity and withdrawing the fluid by suction. See Aspirator; Dropsy; Pleurisy.

Tap-root. Name given to the primary root of most dicotyledonous plants. It is the continuation of the stem below the cotyledons, and from it the secondary or lateral roots arise. In many plants it acts as a storehouse of food, becoming thickened and round, as in the turnip, or conical as in the carrot. See Root.

Tapti. River of India. It rises in the Central Provinces, and flows W. between the Gawilgarh and Satpura ranges to the Gulf of Cambay and the Arabian Sea. The silting up of its lowest reaches has interfered with the development of Surat, the chief town on its banks. Its length is 450 m.

Taquary OR **TACUARY.** River of Brazil, affluent to the Paraguay. It is entirely within the state of Matto Grosso, and flows W.S.W. for 450 m. to the Paraguay near Bahia Negra.

Tar. Black oily liquid with characteristic odour obtained by the destructive distillation of coal, wood, and bituminous minerals. Tar varies in composition according to its source, but all kinds consist largely of hydrocarbons and contain suspended carbon, causing the black colour. By distilling coal tar various constituents are separated, and become the raw material for making dyes, drugs, synthetic resins, and plastics. The solid and brittle mass left is known as pitch.

The distillation of wood yields (a) a watery liquid containing acetic acid, acetone methyl alcohol (wood naphtha); (b) a mixture of

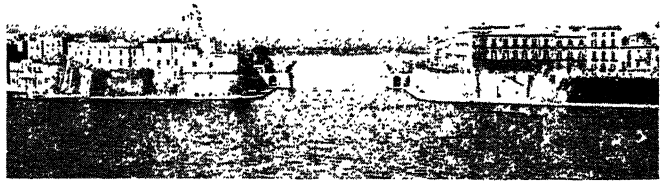
light hydrocarbons; (c) a tar which distills between about 130° and 230° C.; (d) a residue of pitch. Distillation can be continued until a charcoal remains. Wood tar contains phenolic bodies such as carbolic acid and cresol and is used as a protective coating for fences and wooden structures. Stockholm or Archangel tar is obtained by distillation—usually by crude methods of the charcoal-burning type—from the pines of N. Europe. Wood tar has medicinal application in the treatment of skin diseases.

Shale tar is an oily liquid obtained in the S. of Scotland by the destructive distillation of bituminous shale. By distillation and chemical treatment, burning oil, lubricating oil, and paraffin wax are obtained. Blast-furnace tar is produced by cooling the waste gases from blast furnaces in which iron is smelted. This variety contains little or no benzene, naphthalene, or anthracene, but considerable paraffin. Blast-furnace tar and similar tar obtained from coke-ovens are valued for their phenolic contents. Water-gas tar is a by-product in the manufacture of carburetted water-gas. The most familiar use of tar is still as a dust-preventing agent in road-making. See Coal; Shale.

Tara, TARO, or KALO. Name given to the tuberous roots of certain herbs and shrubs of the genus *Colocasia*. Natives of the Pacific islands, the plants, especially *C. macrorrhiza*, are cultivated for their edible leaves and starchy, edible tubers. The tara-fern (*Pteris esculenta*), common in Australia and New Zealand, is allied to bracken. The rootstock is roasted and eaten by natives.

Tara. Village of Meath, Eire. It stands on the Boyne, 6 m. S. of Navan, and is famous for its historic associations. On the Hill of Tara, 507 ft. high, the kings of Ireland had a palace, and there are other remains of what was once an important centre of early Irish life and culture. S. Patrick preached on the hill, on which the kings were crowned and to which the people were summoned for national assemblies. The place was abandoned, it is said, because of a curse passed upon it by S. Ruadan in the 6th century. In 930 the Danes were defeated here, and in 1798 a like fate befell the insurgent Irish.

Taranaki. Provincial district of N. Island, New Zealand. It was at one time covered with forests, but the greater portion has now been



Taranto, Italy. Entrance to the harbour showing, left, the 16th century castle, and, right, naval buildings

cleared, and settled. The industries are dairying, cattle-raising, and sheep-farming; the exports, cheese, butter, meat, and wool. The shores have large deposits of iron sand. New Plymouth is the chief town. Area 3,750 sq. m. Pop. 80,000.

Tarantella. Neapolitan dance. A dance in triple time for two people, it commences slowly and gradually increases in speed until it becomes very rapid. The violin is used as an accompaniment, but tambourine and castanets are played by the dancers. The perspiration it induced was supposed to cure the bite of the tarantula.

Tarantism OR **TARANTULISM.** Form of hysteria prevalent in Europe in the 13th and 14th centuries. It continued up to and during the 17th century. The disorder was formerly believed to be due to the bite of the tarantula. The dancing mania, as it was also termed, occurred in epidemic form. Those affected were seized with convulsions in which they screamed, foamed at the mouth, and executed frantic leaps into the air or danced wildly until exhausted.

Taranto. Seaport of S. Italy. In the prov. of Taranto, Apulia, it is the ancient Taras or Tarentum, and is 44 m. by rly. W.S.W. of Brindisi, on an island at the head of a deep inlet of the Gulf of Taranto. The fortified harbour is one of the safest in the country and an important naval base. There are shipyards, docks for battleships, nautical school, and commercial harbour; also the 11th century cathedral of S. Cataldo, castle, museum, and bishop's palace. The industries include fishing and oil refining. Chemicals, wheat, and fruit are exported. Pop. 180,852.

Founded by Sparta in the 8th century B.C., Tarentum became the wealthiest city of Magna Graecia, largely owing to its trade in woollen fabrics. Attacked by Rome, 281 B.C., it called in Pyrrhus, but was taken by the Romans, 272. In the second Punic War it re-

volted, 212, but was taken and severely treated, 209. It then decayed, and the inhabitants became notorious for luxury and effeminacy. After passing to the Goths and Byzantines, Taranto was destroyed by the Saracens in A.D. 927, rebuilt 967, and captured by the Norman Guiscard, 1063. The British aerial attack on the naval base in 1940 is described below. On Sept. 9, 1943, British troops of the 1st Airborne div. were landed by the R.N. without opposition, the Germans having withdrawn. The port was found to be little damaged, and became one of the chief bases for the Allied armies.

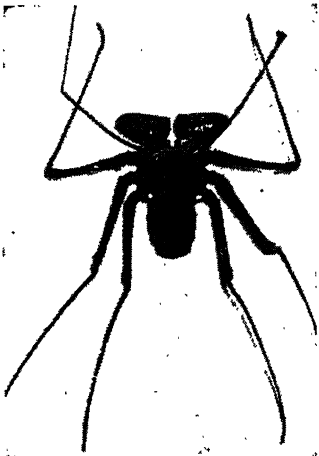
Taranto, ATTACK ON. Spectacular and successful action of the Fleet Air Arm in the Second Great War, Nov. 12, 1940. A large part of the Italian fleet was concentrated at Taranto to cover the passage of reinforcements and supplies to the hard-pressed Italian armies in Albania. British air reconnaissance showed six battleships, including the new 35,000-ton Littorio and Vittorio Veneto, in the outer, and 10 cruisers, 18 destroyers, a seaplane carrier, and 10 submarines in the inner harbour.

On the evening of Nov. 11, ten Maryland bombers and eleven Swordfish torpedo aircraft took off from the carriers *Illustrious* and *Eagle* well out to sea. The Marylands arrived over Taranto shortly after midnight to drop flares. Immediately afterwards the Swordfish came in at 5,000 ft. and then glided to 50 ft. to drop their torpedoes. The confined space of the harbours and low altitude of the attacking aircraft prevented the full weight of the A.A. artillery from being brought to bear on the attackers and only two machines were lost. Next morning photographic reconnaissance revealed one battleship sunk, the Littorio beached with her fore-castle under water, two cruisers listing, and two smaller warships with their sterns under water. The surviving vessels soon withdrew to the safer base at Cagliari.

Not only did the attack on Taranto do much to redress in British favour the balance of naval power in the Mediterranean; it emphasised the potentialities of air torpedo attack against even heavily defended ships, and stressed the vulnerability of warships to such attacks when at anchor.

Taranto, GULF OF. Indentation of Italy on the Mediterranean Sea. It is 70 m. wide, and lies between the heel and toe of Italy.

Tarantula (Ital. *tarantola*). Name properly given to wolf-spiders of the genus *Lycosa*, and in



Tarantula. The wolf-spider found in southern Italy

particular to the species *L. tarantula*, common near Taranto, whence its name. These spiders pursue their prey by running. Many form no retreat; others burrow in the ground.

Tarapacá. Large province in N. Chile. Its E. boundary with Bolivia lies amid the Andes, and on the N. lies Peru. Tarapacá is mainly an arid desert with immense deposits of nitrate. Guano, silver, copper, gold, and nickel are mined. Sheep and alpacas are reared; cotton and fruits are grown near the few watercourses. The volcano Isluga rises to 18,140 ft. in the N.E. The Longitudinal rly. runs S. from Pisagua. Iquique is the capital. Area of dept., 21,340 sq. m. Pop. 104,097.

Ta-ra-ra Boom-de-ay. Popular chorus song. Based on an American negro ditty, it was originally sung, with words by R. Sayers, in a U.S. minstrel show called Tuxedo. An English version, with words by B. M. Batchelor, was first introduced as a song and high-kick dance by a music-hall artist, Lottie Collins, at the London

Tivoli in Oct., 1890, and proved so popular that it swept the country. Introduced to the Continent, it was accepted there as the English song *par excellence*, and remained so until superseded by Tipperary during and after the First Great War.

Tarare. Town of France. In the dept. of Rhône, it stands on the Turdine, 21 m. W.N.W. of Lyons. It is a centre of the weaving industry, silks and other textiles, including muslins and velvets, being manufactured. There is an agricultural trade. Mt. Tarare overlooks it. Pop. 10,142.

Tarascon. Town of France. In the dept. of Bouches-du-Rhône, it stands on the left bank of the Rhône, 62 m. N.W. of Marseilles. The chief building is the church of S. Martha, with the tomb of the saint. The legend is that Martha, sister of Lazarus, arrived here, and delivered the people from a dragon. An annual fête long commemorated the supposed event. There is a castle, once the residence of the rulers of Provence, and a town hall, dating from the 17th century. On the other side of the Rhône is Beaucaire. The industries include the manufacture of glass and hats. Tarascon was built on the site of a Roman city, and in the Middle Ages was one of the most important places in Provence. Mt. Tarascon is a hill near the town. Tartarin (g.v.) de Tarascon is the hero of a series of stories by Daudet. Pop. approx. 9,000.

Tarawera. Active volcano in New Zealand, in the Rotarua Hot Springs dist. of Auckland prov.; 90 m. N.N.W. of Napier. The region of the famous hot springs, which includes volcanoes, has been more or less extinct since the Tertiary period, from which dated that amazing natural phenomenon, the pink and white sinter terraces of Rotomahana. On June 10, 1886, Tarawera erupted and split in two,

leaving a fissure 8 m. across and twenty new craters, and when the ash storms cleared from the 4,000 sq. m. of country obscured by them, the famous terraces had vanished.

Tarazona. City of Spain, the ancient Turiaso. In Saragossa prov., it stands on the Queiles, a tributary of the Ebro, 14 m. by branch rly. S.W. of Tudela. The 12th century cathedral has finely ornamented 16th century cloisters, and the Romanesque church of La Magdalena has a splendid steeple. Pop. 9,500.

Tarbell, IDA MINERVA (1857-1944). American biographer. Born Nov. 5, 1857, in Erie co., Pa., she went from Allegheny College, Meadville, to study history and political science at the Sorbonne. From 1894 to 1915 she held editorial



Ida M. Tarbell, American biographer

posts with McClure's and the American Magazines. Thereafter she devoted her life to biographical and historical research, and though her literary output was large, her standard was high. Lives that may be mentioned are of Napoleon, 1895; Madame Roland, 1896; Lincoln, 2 vols., 1900; and she wrote a History of the Standard Oil Company, 1904; The Rising Tide, 1919; Nationalisation of Business, 1936; and the autobiographical All in a Day's Work, 1939. She died Jan. 6, 1944.

Tarbert. Village of Argyllshire, Scotland. It stands on the E. side of the Mull of Kintyre, on the neck of land that just prevents the Mull from becoming an island, 30 m. N. of Campbeltown. It has remains of a castle associated with Robert Bruce. The chief industry is the herring fishery, and there is a good harbour. Pop. 1,983. Tarbert

is not to be confused with Tarbet, on Loch Lomond.

Tarbert. Two sea-lochs of Argyllshire, Scotland, known as East and West. They are situated at the N. end and on either side of Kintyre peninsula, and extend inland to within a mile of each other, almost severing the peninsula from Knapdale.



Tarascon, France. The Gothic castle dating from the 14th-15th centuries

Tarbes. Town of France. The chief town of the dept. of Hautes-Pyrénées, it stands on the Adour, 98 m. W.S.W. of Toulouse. The chief church is Notre Dame, once a cathedral; parts of it date from the 12th century. The town is also a Protestant stronghold. There is a Carmelite church, and in the Jardin Massey is a museum. The town is a centre of horse-breeding, and has fairs; tanning is another industry. Tarbes originated as a Roman station, and was afterwards the capital of the county of Bigorre, the counts having a castle here. It was in possession of the English, 1360-1406, and in 1814, during the Peninsular War, the English defeated the French here. The revolutionary Barère de Vieuzac was born here. Pop. 44,854.

Tarbolton. Village of Ayrshire, Scotland. It stands on Fail Water, 5 m. E. of Prestwick Airport, and has associations with Burns. Near here on Oct. 21, 1948, a Dutch air-liner crashed with the loss of 40 lives. Pop. 5,131.

Tardieu, ANDRÉ PIERRE GABRIEL AMÉDÉE (1876-1945). French statesman. Born in Paris, Sept. 22, 1876, he was educated at the École Normale, and entering the diplomatic service, acted as attaché at Berlin, 1897. Secretary to the council of ministers, 1899-1902, he entered the chamber of deputies, 1914, and was high commissioner for France in the U.S.A., 1917-19. A collaborator with Clemenceau, with whom he founded the Echo National, he represented his country at the Versailles peace conference, 1919-20, and later came forward as a leading Right-wing politician opposing any revision of the treaty. He was minister of public works in 1926, and three times prime minister: Oct., 1929-Feb., 1930; March-Dec., 1930; Feb.-May, 1932. His last public office was that of minister without portfolio under Doumergue, 1934. Tardieu, who had a severe nervous breakdown in 1939, died Sept. 15, 1945.

Tardigrada OR BEAR-ANIMALCULES. Minute animals from one-third to 1 mm. in length, of doubtful position, but apparently more nearly related to the arthropods (*q.v.*) than to other groups. They are segmented, more or less worm-like, but have four pairs of rudimentary legs ending in claws. The head is furnished with a pair of minute eyes, and the mouth is suctorial. They are found on moss, the bark of trees, in ditches and house-gutters. One species, *Macrobrotus macronyx*, is restricted



Tarbes, France. General view of the town in which the 12th century church of Notre Dame is seen, centre

to fresh water, several are exclusively marine, but most species are terrestrial, inhabiting damp places.

Tare and Tret (Fr. *tare*, loss, waste; Old Fr. *traite*, draught, transportation). Commercial term for allowances made in weighing goods. Tare is the amount deducted from the gross weight for the packing or vehicle in which the goods are weighed, and is reckoned as real, customary, or average, according to whether the wrappings or vehicle are actually weighed, or a specified rate allowed, or an average struck between several examples. Tret is an allowance of extra weight to cover possible waste in transport.

Tarentum. Name of a Roman city, now called Taranto (*q.v.*).

Tares. Leguminous forage crop, also known as vetch (*q.v.*).

Target. Mark at which to shoot. It is derived from the Old French *targete*, a shield, which the early targets resembled. In modern use the word target indicates any object fired at; and, by extension, any figure of industrial production aimed at, or any sum which collectors hope to raise. Rifle practice targets were all of the bull's-eye pattern until after the S. African War; they are now silhouette figures and show the rough outline of a man lying down to fire, in neutral brown on a ground that is blue-grey above and dull green below. See Bisley; Musketry.

Targoviste OR TARGOVISHTA. Town of Rumania. On the W. border of the important oil-fields, it is situated in Wallachia, at the foot of the Carpathians, about 50 m. N.W. of Bukarest. It has an ancient cathedral and a small arsenal. Before the First Great War a thriving place, it was much damaged when the Austro-Germans took it in Dec., 1916.

Targum. Aramaic versions of the Hebrew Scriptures. In course of time Hebrew as a language understood by the mass of the Jewish people was supplanted by Aramaic. Consequently, when the Hebrew Scriptures were read in the synagogues, the services of a translator were required. This official was called the *methurgeman* or *targeman* (mod. *dragoman*, interpreter); and when later the translations were committed to writing, they were called Targums.

Tarifa. Maritime and most southerly town of Spain. It is in the prov. of Cadiz, 21 m. by rly. S.W. of Gibraltar. Its Moorish walls and an ancient citadel still stand. It has fisheries and trades in fish, fruit, especially oranges, cattle, and leather. Known to Strabo as Julia Joza, and to Ptolemy as Julia Transducta, it was named Tarifa after a Moorish captain Tarif ibn Malik. It was unsuccessfully attacked by the French in 1811, when it was defended by General Gough. Population 13,000.

Tariff (Span. *tarifu*, book of rates). List of rates or charges or prices; particularly, the official list of goods on which duty is payable to the govt. of a country and the rates at which the duties are chargeable when the goods are imported or exported (customs duties), or manufactured (excise duties). Such tariffs tend to be altered frequently, according to the economic policy of the govt. and the circumstances of international trade. During the 1930s the tariffs of most countries became both more extensive and more complicated as countries endeavoured to protect their own production or to discourage the import of certain commodities in order to conserve their foreign

exchange. The international trade organization of the U.N. advocated an all-round lowering of tariffs. The customs and excise tariff of the U.K. is published annually by H.M.S.O., and embodies changes made by Act of parliament or statutory order under previous Acts. *See* Free Trade; Protection.

Tariff Reform. Political term applied particularly to proposals put forward in the first decade of the 20th century for the introduction of a tariff of duties on goods imported into the U.K., accompanied by preference within the British Empire. The proposals therefore opposed the system of free trade which had been virtually in force in the U.K. for 50 years. In 1902 a duty of 1s. a quarter was imposed on imported corn, and Joseph Chamberlain, colonial secretary, counted upon the remission of tax in respect of corn from the colonies. But during Chamberlain's absence in S. Africa in 1903, the chancellor of the exchequer, Ritchie, a free trader, abolished the tax.

In a speech at Glasgow, Oct. 6, 1903, Chamberlain laid down the outlines of his tariff reform policy, and retired from the govt. to prosecute a campaign. He founded a propagandist Tariff Reform league, and before the end of the year had established a tariff commission of influential individualists and agriculturists. The proposals had the general support of the Unionist party, but did not receive that of the public, which returned the Liberals to power by an overwhelming majority at the general election of 1906. Tariff reform was a plank in the Unionist party platform in the two general elections of 1910, but free trade remained in force until 1914. Changed economic conditions after the First Great War led to the gradual abandonment of the principle, but the measures of protection, safeguarding, and imperial preference then introduced were outside the more theoretical scope of the original agitation, the whole subject being attacked afresh from a more practical standpoint. *See* Empire Free Trade; Protection; Safeguarding of Industries.

Tarija. Prov. and town of S. Bolivia. The prov. adjoins Argentina on the S., is mountainous on the W., flat in the E., and is drained by the Pilcomayo. The Tarija Valley has yielded fossil remains of prehistoric animals. There are extensive forests and

pasture lands. The E. forms part of El Gran Chaco. Area of prov., 9,570 sq. m. Pop. 131,900.

The town, also known as San Bernardo de Tarija, is on the river Tarija, an affluent of the Bermejo, 180 m. S.E. of Sucre, to which there is an air service. Pop. 17,000.

Tarim. A river of Sinkiang. Rising in the Karakoram glaciers, its headwaters fall 13,000 ft. in 200 m. to the Yarkand plain, whence it flows for about 1,000 m. into the Lop-nor marshes. It was once the home of the Issedones, Yueh-chi, Tocharians, Uigur, and other peoples. The ancient civilization of the Tarim basin, developed under less arid conditions, and fostered by irrigation, stands revealed by exploration, notably by Sir Aurel Stein in 1907 and 1914.

Tarkhan. Site of an ancient necropolis near Kefr Ahmar, on the left Nile bank, 37 m. S. of Cairo, Upper Egypt. Petrie's excavations in 1912-13 revealed closely packed graves along a mile of desert, and a thousand graves in the valley below, ranging from predynastic to the pyramid times.

Tarkington, (NEWTON) BOOTH (1869-1946). American novelist. He was born at Indianapolis, July 29, 1869, and educated at Purdue university, Lafayette, and at Princeton. He sat for two years in the Indiana house of representatives, but soon gave up politics and devoted himself to writing. His first novel, *The Gentleman from Indiana*, 1899, was an immediate success, as was *Monsieur Beaucaire*, 1900, a sentimental romance which was widely popular as a novel, a play (1901), and many years later as a film. He wrote many other books of varied types, but almost all centred around his

native state. Penrod, 1914, and Seventeen, 1916, were gently ironical studies of boyhood. The Mag-

nificent Ambersons, 1918, was awarded the Pulitzer prize, and in 1921, when he won it again for *Alice Adams*, Tarkington secured an honour among American novelists. He also wrote many plays successful in New York and London. He died May 19, 1946.

Tarkwa or **TARQUAH.** Gold-mining centre of the Gold Coast Colony, W. Africa. It is 39 m. by rly. N.W. of Sekondi. A branch line runs to Prestea and Broomassie.

Tarlatan. Thin open muslin. It was originally made in India, and may derive its name from the Indian fabric *tarnatan*. It is used as a dress material, and for widows' caps, etc., and is white, dyed, or printed. *See* Muslin.

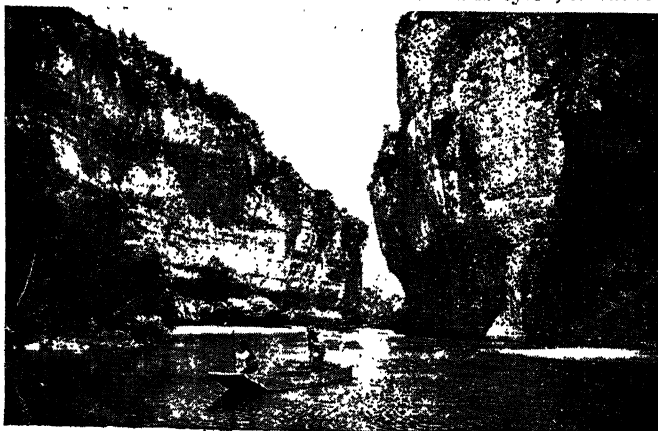
Tarn. Small mt. lake, especially one having no visible feeders. Tarns are found at high elevations, and in comparison with their size are usually deeper than the large valley lakes of lower levels. Sty Head Tarn, near the head of Sty Head Pass, and Hard Tarn, near Helvellyn, are examples of tarns in the Lake District of England. *See* Lake.

Tarn. River of France. Rising in the Cévennes, it flows for 220 m. past Albi and Montauban (*q.v.*) into the Garonne. Among its tributaries are the Agout and Aveyron.

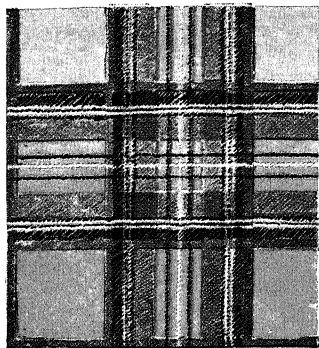
Tarn. Dept. of France. Adjacent to the depts. of Tarn-et-Garonne, Haute-Garonne, Aude, Hérault, and Aveyron, it was for-



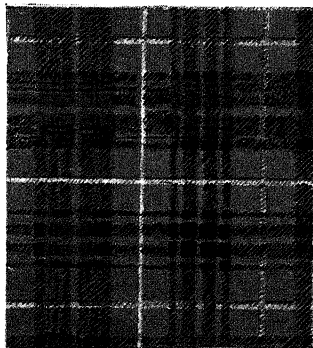
Booth Tarkington, American novelist



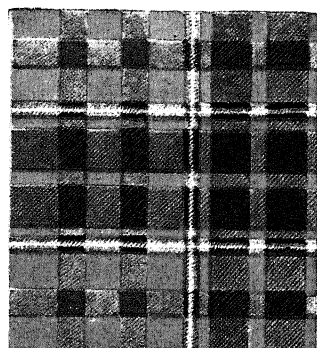
Tarn, France. Les Étroits, one of the most beautiful of the gorges of the Tarn, where the river flows between richly coloured limestone cliffs



STEWART, DRESS



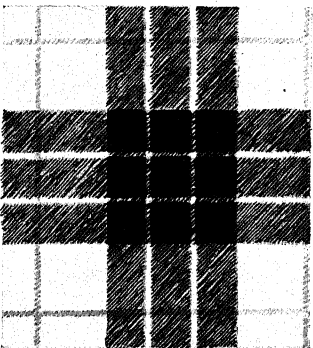
STEWART, HUNTING



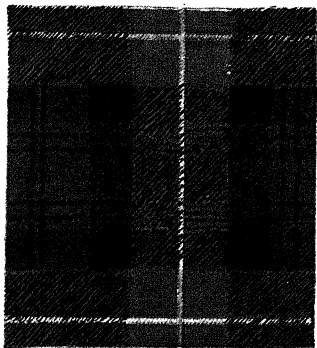
CAMERON OF LOCHIEL



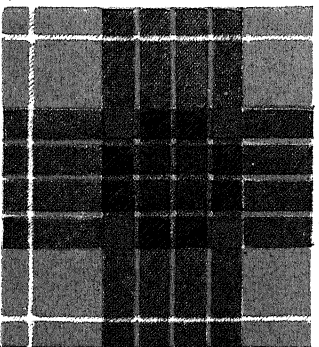
MACDONALD, CLAN DONALD (N. & S.)



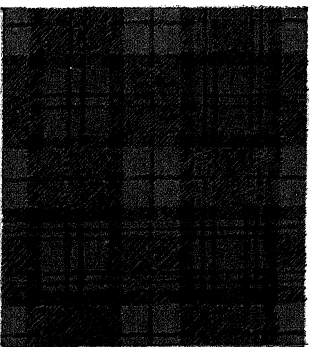
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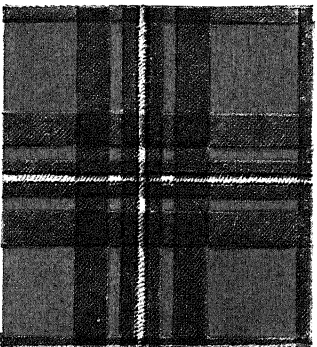
CAMPBELL OF ARGYLL



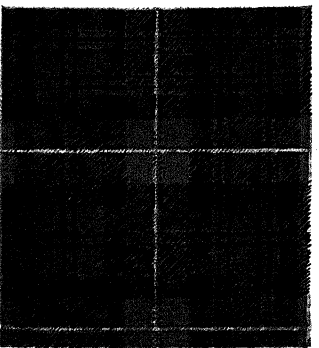
FRASER, DRESS



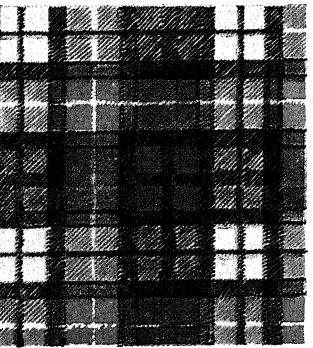
BLACK WATCH



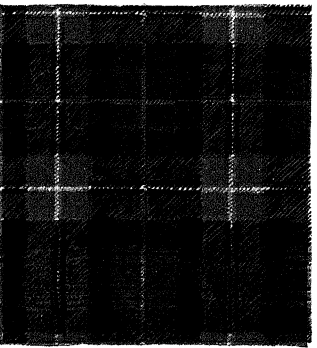
MACGREGOR



GORDON (GORDON HIGHLANDERS)



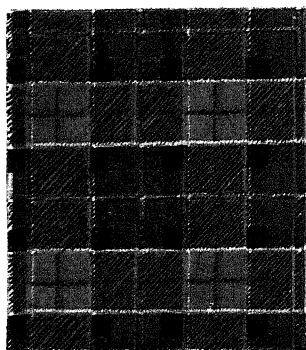
BUCHANAN



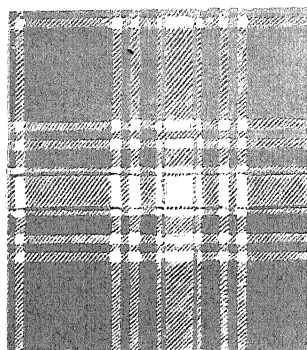
MACKENZIE

The Stewart dress tartan is worn by pipers of the Scots Guards, Black Watch, and King's Own Scottish Borderers, the Stewart hunting tartan by the pipers of the 2nd batt. Royal Scots Regt.; the Black Watch tartan by the Royal Highlanders and Royal Scots Fusiliers; and the Mackenzie tartan by Seaforth Highlanders and Highland Light Infantry

TARTAN MARKINGS OF PLAID AND KILT WORN BY SCOTTISH CLANS AND REGIMENTS



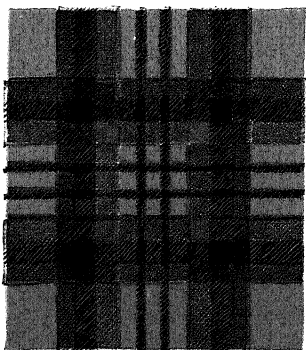
LESLIE, HUNTING



MENZIES, DRESS



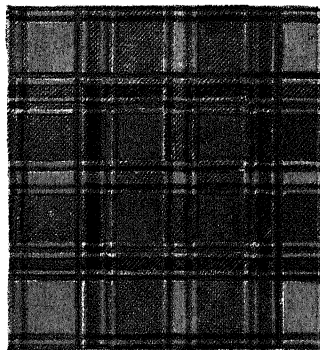
MACINTYRE



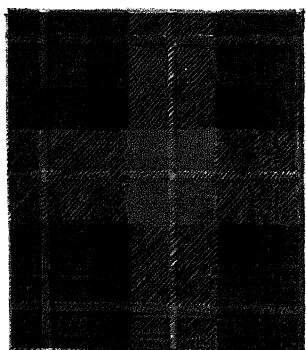
MACDUFF, DRESS



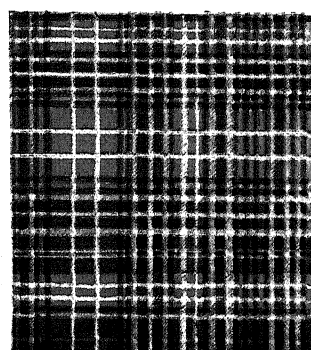
MACPHERSON, HUNTING



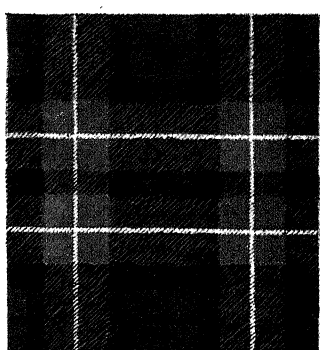
GRANT



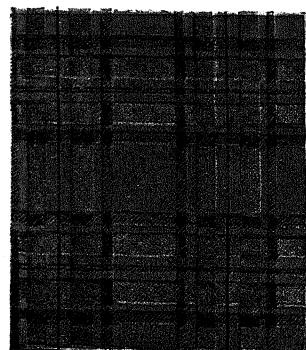
FARQUHARSON



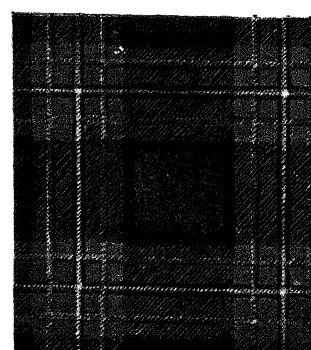
OGILVY, DRESS



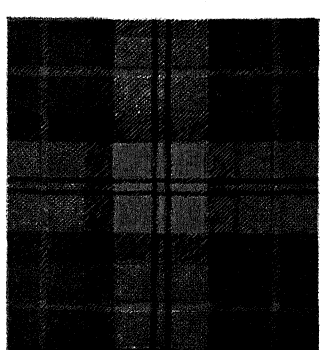
GRAHAM OF MONTROSE



MACINTOSH



MACLAREN



MACLACHLAN

TARTAN: MARKINGS OF PLAID AND KILT WORN BY SCOTTISH CLANS

See over]

merly part of the prov. of Languedoc. Generally mountainous and with picturesque gorges, the E. and S.E. of the dept. are high, stony, plateau lands, of granite and schist formations, and to the W. are flat and fertile plains. The Tarn river traverses the dept. from E. to W., with its chief tributary, the Agout, other streams being the Dadou, Thoré, and Vère. Chiefly agricultural, Tarn is noted for its cereals; cattle and sheep are important in the S., and there are forests of beech and chestnut. The capital is Albi, and other towns are Castres, Gaillac, Lavaur, Carmaux, Graulhet, and Mazamet. Its area is 2,231 sq. m. Pop. 298,117.

Tarn-et-Garonne. Dept. of France. Adjacent to the depts. of Haute-Garonne, Tarn, Aveyron, Lot, Lot-et-Garonne, and Gers, it was formed in 1808 of portions of surrounding depts. The low hills of the S.E. and the N. and N.W. enclose a broad alluvial and fertile plain. The rivers Tarn, Garonne, and Aveyron all meet in the dept. Wheat, maize, oats, rye, and flax are grown. Montauban is the capital, other towns being Castelsarrasin, Moissac, Caussade, Nègrepelisse, and Grisolles. Its area is 1,440 sq. m. Pop. 167,664.

Tarnopol. Town of Ukraine S.S.R. On the Seret, 87 m. E.S.E. of Lvov by rly., it was founded in the 16th cent. by John Tarnowski, lord of Cracow. Before the First Great War Tarnopol lay in Austria-Hungary, after it in the new state of Poland, in the area occupied by Russia in 1939 and ceded to her by the Russo-Polish agreement of Aug., 1945. In the 1930s it had 31,000 inhabitants, half of them Jewish. It had manufactures of cloths and linens, and a trade in honey, wax, leather, and brandy.

Occupied by the Russians after several days' fighting about Aug. 27, 1914, Tarnopol was the centre of heavy fighting Sept. 6-16, 1915, but remained in Russian possession. On July 19, 1917, a div. stationed there deserted in a mass, leaving a gap of 25 m. in the Russian line. Panic spread throughout the Russian army, and by the 22nd the town was in Austro-German hands. British armoured cars stationed at Kozova attempted to hold up the Austro-German advance without success, the Russian infantry all along the front leaving their trenches and retiring. The Austro-Germans reached the then Russian frontier at Husiatyn by the end of the month.

During the Second Great War Tarnopol was overrun by the Ger-

mans by July 6, 1941, and remained in their hands until 1944, when by March 12 there was violent fighting in and around the town. Owing to the efforts required to liquidate large German forces encircled at Skala some 20 m. to the S.E., the Russians did not succeed in regaining control of Tarnopol until April 15, after several days of desperate street fighting reminiscent of the battle of Stalingrad; only 2,400 of the German garrison of 16,000 surrendered.

Tarnow (Russ. Tarnov). Town of Poland, in Galicia. It is 50 m. E. of Cracow, being situated on the E. bank of the Dunajetz near its junction with the Biala, and manufactures agricul-

tural implements and leather. The 15th century cathedral contains monuments of the Tarnowski family. It was prominent in the fighting in Galicia (q.v.) in the First Great War. In the part of Poland occupied by the Germans in 1939, it remained in their hands until taken by the Russians, Aug. 6, 1944, who did not advance farther in S. Poland until Jan., 1945. Pop. 36,000.

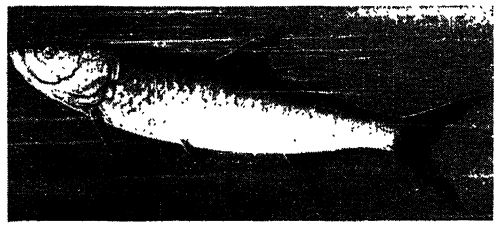
Tarnow or **POPRÁD PASS.** Pass in the E. Beskid section of the Carpathian mts. It has a height of 2,630 ft. and carries the rly. from Kosice (Kassa) to Nowy Sącz (Neu Sandec) and Tarnow. Here the Poprád, an affluent of the Dunajetz, cuts its way through the mts. on the frontier between Czecho-Slovakia and Poland.

Taro (*Colocasia antiquorum*). Herb of the family Araceae. It is a native of the East Indies, but is extensively cultivated throughout the tropics and in S. Europe, as a food crop. It has a large tuberous rootstock from which the large oval heart-shaped leaves spring direct. The entire plant is very acid, but the acidity is got rid of by boiling, and the naturally poisonous leaves may be eaten like spinach. The rootstocks are rich in starchy matters, which also become available as food when boiled in two or more waters. See Eddo.

Tarpaulin. Heavy weather-proof cloth used for protecting goods on docks and rlys., for van covers, seamen's hats, and other purposes. It is made of hemp, flax, cotton, or jute, treated with tar or some similar preparation, and is manufactured chiefly in Scotland.

Tarpeia. In ancient Roman legend, daughter of Spurius Tarpeius, the governor of the citadel on the Capitoline Hill. Bribe by the besieging Sabines with gold bracelets and collars, she betrayed the garrison by opening a gate, but the Sabines as they entered crushed the traitress to death with their shields. The memory of her baseness was perpetuated in the name of the cliff on the Capitoline hill, the Tarpeian rock from which traitors were hurled to death. See Capitol; Olympus; Rome.

Tarpon (*Megalops atlanticus*). Huge fish of the order Teleostei. It is a native of the S. Atlantic, whence it enters several of the



Tarpon. The South Atlantic fish which affords good sport for anglers off the coast of Florida

rivers in pursuit of mullet. Much resembling a huge herring in form and colour, it is seven feet in length and weighs 2 cwt. From the hinder part of the dorsal fin there is a long streaming thread-like extension; and the silvery scales are four inches across. It leaves the egg in the larval stage, when it is not unlike the corresponding stage of the eels, colourless and scaleless, and temporarily is reduced in size when it assumes the adult form. It is considered a game fish, and affords good sport with rod and line in the Gulf of Florida.

Tarquinii (mod. Corneto Tarquinia). Ancient city on the W. coast of Etruria, Italy. Situated on the Marta, it was one of the twelve Etruscan cities; it frequently came into conflict with Rome, notably when it combined with Veii in an attempt to restore the Etruscan Tarquinus Superbus to his throne at Rome. It was finally subdued by the Romans about 300 B.C. The ruins which remain are of the Roman period; the site of the older and purely Etruscan city was probably a little to the S.W. Some fine examples of early paintings have been discovered in the rock tombs. See Corneto Tarquinia.

Tarquinus Priscus, **LUCIUS**. Fifth of the legendary kings of ancient Rome, reputed to have reigned 616-578 B.C. Exiled from Corinth, when Cypselus became tyrant there, and married to an Etrus-

can woman named Tanaquil, he went to Rome, where he won the favour of King Ancus Marcius, and changed his original name of Lucumon to Tarquinius. Elected king when Ancus died, he proved himself a vigorous ruler, defeating the Latins and the Sabines. Among the public works with which Tarquin was credited were the large and splendidly built sewers, some of which are still in use in the city of Rome. He was murdered by the sons of Ancus Martius.

Tarquinius Superbus, LUCRUS. Seventh and last of the legendary kings of Rome, reputed to have reigned from 534 to 510 B.C. Though an able and vigorous monarch, who carried the Roman arms farther than any of his predecessors had done, he incurred odium at home by his oppressive tyranny. The violation of Lucretia by his son Sextus Tarquinius caused a revolt, and Tarquin and all his family were banished from Rome. Assisted by the Etruscans, Tarquin made several attempts to return, but his hopes were shattered by his defeat in the battle of Lake Regillus, 496, the site of which has been conjecturally identified with the valley of Isidoro. Tarquin then fled to Cumae, where he died. See Brutus; Lucretia; Rome.

Tarragon (*Artemisia dracunculus*). Perennial herb of the family Compositae, indigenous to



Tarragon. Leaves and sprays of flower-heads of the bitter herb. Inset, single flower-head

S. Europe. Its stems are about two feet high, with narrow oblong leaves, and roundish pale-green flower-heads. The aromatic leaves are without the bitterness characteristic of most species of *Artemisia*, and are used to flavour salads, pickles, and Tarragon vinegar.

Tarragona. Maritime prov. of N.E. Spain. It lies between Barcelona and Castellon provs., slopes from the W. hills to the Mediterranean, and contains the lower

course and delta of the Ebro. The slopes are well forested; fruit, nuts, olive oil, wine, wheat, hemp, and silk are produced. The prov. is noted for its wines, a popular variety of which is named after it. There are manufactures of textiles, leather, soap, flour, spirits, and paper. Besides Tarragona, the capital, Reus and Tortosa are important towns. Area, 2,426 sq. m. Pop. 332,106.

Tarragona. Seaport city of N.E. Spain, capital of Tarragona prov., and the seat of an arch-



Tarragona, Spain. The west facade of the 12th century cathedral, noted for its magnificent rose window

bishop. The ancient Tarraco, it is on the Mediterranean Sea, 63 m. by rly. W.S.W. of Barcelona, crowning a steep hill 525 ft. in elevation and surrounded on three sides by massive walls of Cyclopean and Roman origin. The old town has a noble cathedral, chiefly 12th and 13th centuries, an archbishop's palace, and remains of Roman buildings. The new town stretches down to the spacious harbour. Water is conveyed by a Roman aqueduct 750 ft. long. Chartreuse liqueur is made by Carthusian monks, and wine, olive oil, and nuts are exported. The city was captured by the Scipios in 218 B.C. and became the capital of the Roman colony Hispania Tarraconensis. Captured successively by the Visigoths in 467, the Moors in 713, the Christians in 1089, and British in 1705, it was sacked by the French in

1811, and fell to the forces of Gen. Franco and Italian supporters, Jan. 15, 1939. Pop. approx. 34,000.

Tarrasa. City of Spain, the ancient Egara. In Barcelona prov., it is situated 20 m. by rly. N.W. of Barcelona city; it has textile factories, an industrial institute, and a technical school. There is a trade in wheat, wine, olive oil, and fruit. Pop. 38,000.

Tarrytown. Village of New York, U.S.A., in Westchester co. It stands on a bay in Hudson river, 25 m. N. of New York City, and is served by the New York Central rly. It is the Sleepy Hollow of Washington Irving, whose grave is in Sleepy Hollow cemetery, about a mile outside. Features are the Dutch church, built 1685, and Philipse manor house, 1683. Pop. 6,874.

Tarshish. Biblical name of an unidentified Phoenician mart. It is presumably the classical Tartessus, a shipping port for metals in S.W. Spain, near the Guadalquivir mouth, then farther inland. Excavations in a cliff at Seville, 1912, revealed Roman, Greek, and Bronze Age levels, not unreasonably identifiable with Tartessus. The Red Sea Tarshish ships (1 Kings 22) were merchantmen like those in the Tarshish trade.

Tarsier (*Tarsius spectrum*). Small lemuroid primate. It is a native of Borneo, Sumatra, and other islands of the Malay Archipelago. Smaller than the European squirrel, and of similar arboreal habits, it is remarkable for enormous eyes and great length of ankle. At the tips of the fingers and toes there are disks which help it in climbing. The skull of the tarsier approaches more nearly to the ape type than that of any other lemur. It is nocturnal in habit, hunting for the insects which are its chief food, and sleeping by day in a tree-hole shared by its mate.



Tarsier. Remarkable for enormous eyes, these lemur-like animals are common in the Malay Archipelago

Tarsus. In anatomy, the back part of the foot, from the heel to the metatarsal bones. Tarsus is the name of a layer of connective tissue in the eyelid. *See* Ankle.

Tarsus. Ancient city of Cilicia, Asia Minor. The modern Tersus, it is about 12 m. from its port at the mouth of the Cydnus. Originally a Syrian city, it became a centre of Greek culture, besides being one of the most prosperous cities of Asia Minor. Before its incorporation in the Roman empire as capital of the prov. of Cilicia, 66 B.C., it had been subject to Persian rule, and afterwards to



Tarsus, Asia Minor. Noted as the birthplace of S. Paul, after whom the gate shown here was named

that of the Seleucid kings of Syria. It was the birthplace of S. Paul, who, before his conversion, was known as Saul of Tarsus.

Tartaglia, Nicolò (c. 1505-57). Italian mathematician and scientist. He was born at Brescia and was a lecturer at Verona, and later professor of mathematics at Venice, where he died Dec. 14, 1557. His reputation rests on a treatise upon arithmetic and studies of cubic equations, the theory of falling bodies, and the range of projectiles. *Pron.* Tartahl-ya.

Tartan. Woollen cloth with coloured check pattern. Early tartans were sometimes of one colour only. The word is apparently derived from French *tiretaine* (linsey-woolsey), and may ultimately come from Tartar. Tartar cloth was the general term for various Oriental cloths, and in 1488 tartan is spelt tartar. The name is specially applied to the kilt and plaid of the national dress of the Highlanders of Scotland, the variations in the markings denoting the different clans. The distinctive sets or patterns of clan tartans are believed to have been settled before or during the 17th century. Wearing Highland dress was forbidden after the rebellion of 1745, but the prohibiting Acts

were repealed in 1782, and clan tartans are still recognized as national dress at the British court and still used as full dress in the Highland regts. Clothmakers have evolved many new combinations of colours and checks. The black and white checkered plaid is called shepherd's tartan. *See* Clan; Highlands; and colour plate facing p. 7952.

Tartar. Name employed in China and medieval Europe for central Asian mounted nomads. Under Jenghiz Khan and his successors, they established the empire of Tartary, and from 1238 to 1462 dominated E. Europe. Derived from the tribal name of the Tata (plur. Tatar), who occupied 5th century Mongolia, the conventional spelling resulted from assimilation with the Latin *tartarus*, hell. In the form Tatar it survives in Russian in the name of the Tatar (q.v.) autonomous republic, and is used also to denote several muslimised groups of Turkic speech.

In European Russia there are probably 2,000,000 of the race. They comprise the Kazan Tartars of the Volga banks, representing the Kipchak irruption; the Astrakhan Tartars of the Volga mouth, remnants of the Golden Horde (q.v.) with Khazar admixture; and the Krim and Nogai Tartars—the former on the mountains and coasts, the latter on the steppes—whereof the Ottoman government in 1861 settled 12,000 in Bulgaria. A few also settled near Plock in Poland. In the Caucasus dwell some 1,500,000. In Siberia and Central Asia they may number 300,000, including the Abakan, Kizil, Altai, and Cholym Tartars, with some Finnic admixture. The Taranches or Ili Tartars are Persianised Kulja Sarts. The name also embraces Tuba and other primitive non-

Turkic Yeniseian stocks which preserve their aboriginal shamanism, and practise hunting and agriculture. *See* Asia.

Tartar. Calcareous incrustation which forms round the base of the teeth when the natural cleansing system is defective.

Tartar Emetic. Common name for potassium antimonyl tartrate $[K(SbO)C_4H_4O_6]_2 \cdot H_2O$, so called because in small doses it causes vomiting. It is one of the few soluble salts of antimony, and is prepared by boiling together three parts of antimonious oxide with four parts of cream of tartar, filtering whilst hot, and allowing crystals of tartar emetic to form. Tartar emetic, formerly used in small doses in medicine, is in larger quantities a violent poison. The chief use of antimony in medicine is in the treatment of certain tropical diseases, e.g. kala-azar, in which tartar emetic has proved strikingly successful. It is also used in large quantities as a mordant in dyeing and calico-printing.

Tartaric Acid ($C_4H_6O_6$), DIHYDROXYSUCCINIC ACID. A colourless, crystalline acid extremely soluble in water. It occurs widely in plants, partly free and partly as the potassium, calcium, or magnesium salts. Tartaric acid is prepared from the argol or crude cream of tartar which is deposited in the casks during the fermentation of wine. *See* Argol.

Tartarin. Chief character in stories by Alphonse Daudet: Tartarin of Tarascon, 1872; Tartarin on the Alps, 1873; Port Tarascon, 1880. An ingenuous creature who finds an outlet for his romantic and adventurous instincts in many amusing and harmless devices, he is used by the author as a vehicle for playful and entertaining satire on the kind of Southern Frenchmen among whom Daudet was born.

Tartarus. In Greek mythology, the prison or place of punishment in Hades of the Titans, and Tantalus, and others who had outraged the gods. It was surrounded by a brazen wall, and veiled in perpetual and impenetrable darkness. *See* Hades.

Tartary. Name formerly used vaguely for the country between the Pacific Ocean and the Dnieper, presumably because much of it was inhabited by the Tartars. Little



Tartar. Left, a Tartar ox-driver, wearing the characteristic "sheska" headgear. Right, A young Tartar

Tartary, also called Krim Tartary, became the name for part of Russia, and Great Tartary for Turkistan and the surrounding district. See Asia; Tartar; Turkistan.

Tartary, GULF OF. Part of the Pacific Ocean. Between the far Eastern region of R.S.F.S.R. and the island of Sakhalin, it connects the Sea of Japan with the Sea of Okhotsk.

Tartu (Ger. Dorpat; Russ. Yuriev). Town of Estonia S.S.R. It stands on the Embach, 110 m. S.E. of Tallinn, with which it has rly. connexion. Most of the town lies S. of the river, and, as a result of a great fire in 1777, it was rebuilt, the old fortifications being replaced by promenades lined with trees. The town is said to have been founded by Yaroslav, prince of Kiev, in 1030, and it was held by the Teutonic knights from 1224 to 1558, when it came into Russian hands. Later it fell successively to Poland and Sweden, being finally established under Russian rule in 1704. From 1918 to 1940 it was in independent Estonia. Occupied by the Germans soon after their advance against the Russians in 1941, Tartu was turned by them into a strongpoint. It was stormed by the Russian 3rd Baltic army under Col.-Gen. Maslennikov, Aug. 25, 1944.

The university here was founded by Gustavus Adolphus of Sweden in 1632, and had, before the Second Great War, some 3,000 students. Tartu also possessed a library of 250,000 volumes housed in a restored part of the cathedral, which had been destroyed by fire in 1624. The town is the centre of a prosperous agricultural and dairy-farming country. Pop. est. 50,000.

Tartuffe; ou, L'IMPOSTEUR (Tartuffe; or, The Impostor). Five-act play by Molière. The first three acts were given at Versailles in 1664. It was at once interdicted, as was a second version, presented at the Palais-Royal in Aug., 1667. On Feb. 5, 1669, however, it was permitted, and had an immediate success. The comedy is a satire on religious pretension masking vice and avarice. The scene is the home of a well-to-do bourgeois named Orgon, a part acted by Molière. One of the greater of Molière's comedies, this play has the defect of a somewhat mechanical ending, Louis XIV being introduced to release Orgon from Tartuffe's power.

Tashi Lama or TESHU LAMA. One of the two Great Lamas of Tibet. He is abbot of the monastery of Tashi Lünpo, and, though subservient to the Dalai Lama in

secular matters, in matters spiritual has an equal, or even greater, authority. See Dalai Lama; Lamaism; Tibet.

Tashkent. Largest city of Soviet Central Asia. It is the capital of Uzbek S.S.R., and stands 450 m. N.E. of Bukhara. It dates back to the 7th century, being captured by the Chinese from the Turks in 659. It came under Russian rule in 1865, when it was made the administrative centre of the then government of Russian Turkistan. The picturesque old city was gradually replaced by the new city, built by the Russians, which was nearly 8 m. long. The houses are low, since earthquakes are frequent. The streets are lined by poplar, willow, and fruit trees, and much fruit, tobacco, and agricultural produce is grown in the immediate neighbourhood. Since the Revolution the city's industry has developed, including cotton mills, chemical factories, and agricultural machinery works. The city has a university and a museum including an outstanding collection of Graeco-Bactrian coins. It is the headquarters of the Russian Army of Turkistan. It is on the Moscow-Bukhara rly., and has regular passenger air connexion with Moscow. Pop. 585,005.

Task, THE. Poem by William Cowper, first published in 1785. In blank verse singularly clear and impressive, the poem, which established Cowper's fame, treats descriptively and thoughtfully of many aspects of human life. It is divided into six books.

Tasman, ABEL JANSZON (c. 1602-59). Dutch explorer. Born near Groningen, he became a sailor in his youth and made several voyages in eastern waters before being given in 1642 command of an expedition sent out by Van Diemen, governor-general of the Dutch East India co. Circumnavigating Australia, he discovered on Nov. 24, 1642, land which he called Van Diemen's Land, but which was renamed Tasmania in 1853. He sailed on to discover New Zealand, the Friendly, and the Fiji Islands. He made another voyage in 1644, when he discovered the Gulf of Carpentaria, and mapped its coast-line with accu-



Tashkent, Uzbek S.S.R. Buildings of the College in the Asiatic quarter of the town

racy. He also explored the N. and W. coasts of Australia as far as 22° S. Tasman commanded other expeditions in 1647 and 1648 before retiring from service and settling in Batavia, where he died.

Tasman Bay or BLIND BAY. Wide opening on the N. coast of S. Island, New Zealand, at the W. end of Cook Strait. The entrance is between Farewell Spit and Cape Stephen, but the steamers from Wellington to Nelson at the head of the bay use French Pass, the strait between D'Urville Island and the mainland. The N.W. corner of the bay is known as Golden Bay, near the shore of which extensive deposits of iron ore are sited.

Tasman Glacier. Largest glacier of the Southern Alps, S. Island, New Zealand. One of the largest glaciers in the world outside the polar regions, it is 18 m. long, 2 m. wide, and about 1,000 ft. deep, and is fed chiefly by the Hochstetter ice fall, a frozen cascade 1 m. in width and 4,000 ft. in height on Mt. Cook.

Tasmania. Constituent state of the Commonwealth of Australia. A large island, it lies S.



Tasmania arms

of Victoria, from which it is separated by the shallow Bass Strait. It stretches from lat. 40° 40' to 43° 40' S., long. 144° 40' to 148° 20' E., is 220 m. from N. to S. and 200 m. from E. to W. It has an area of 26,215 sq. m. Geologists believe that in the remote past it was connected to the mainland by a land bridge across the 140 m. Bass Strait represented by the large granitic islands of the Furneaux group and the islets of Kent group. Physically it forms a dissected plateau of ancient rocks of the same character as the highlands of Victoria. The

E. mts. rise sharply from the coast and culminate in Ben Lomond, 5,160 ft. The W. mts. stretch almost due N. from S.E. Cape; Cradle Mt., towards the N., is 5,069 ft.; E. of Mt.



Tasmania flag

Olympus, 4,680 ft., lies Lake St. Clair. Lying N.W.-S.E., and connecting the other mts., the Great Western Mts. separate the two large drainage basins; here are Great Lake, Lake Sorell, and numerous smaller sheets of water; Dry's Bluff rises to 4,257 ft.

The rivers Tamar, N. Esk, S. Esk, Macquarie, Mersey, Forth, and others drain N., the Derwent, with its tribs., the Huon, and the Coal drain S. This copious supply of water has been harnessed for the provision of electric power for all purposes. The E. coast has few inlets, the W. coast has large indentations, notably Macquarie Harbour and Port Davey.

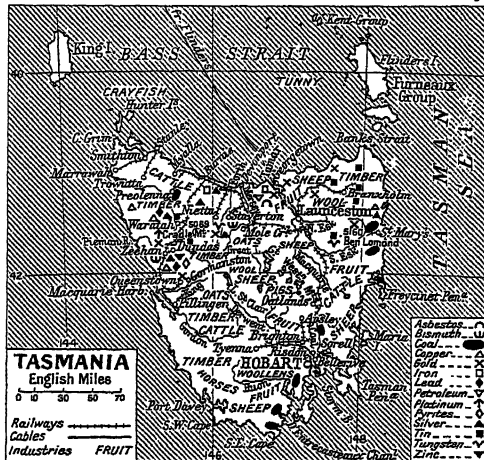
Tasmania has been richly endowed with natural resources. The landscape generally is beautiful, and in the W. very rugged. The climate is one of the finest in the world. Tasmania lies in the path of the westerly winds, and moderate rainfall is experienced in all seasons, with the exception of the mountainous western side, where the yearly totals may exceed 100 ins.; showers add to the summer precipitation. Cloudiness is greater than over the Australian mainland. Summer temps. are pleasant and winters mild, e.g. at Hobart the monthly mean temp. ranges from 62° F. to 47° F.

The island is very popular as a health and holiday resort, many people visiting it from the mainland, especially for the fishing in the lakes. The soil is varied and exceedingly fertile, the vegetation luxuriant. The forests produce many valuable timbers suitable for building and furniture-making, among them that of the eucalyptus, pines, blackwood, myrtlebeech, and sassafras. Wood-pulp for paper is also produced in considerable quantities.

Tasmania's annual production of apples is normally about 7,500,000 bushels; apples have been exported to England from 1884, sometimes to the extent of 3,000,000 bushels a year. Most of the common fruits of England are grown in Tasmania; what is not exported or consumed is made into jam for export. Wool and butter are other valuable products.

Tasmania is rich in minerals, among them being asbestos, bismuth, copper, cadmium, cobalt, coal, limestone, gold, kaolin, lead, ochre, osmiridium, pyrites, scheelite, silica, silver, tin, wolfram, and zinc; but much of this wealth lies in the rugged mts. of the W. and is difficult of access—hence little exploited.

The total value of exports in 1945-46 was over £A 20 million, of which £A 16.5 m. was to Australia. Principal exports were fresh and other fruit, jams and jellies, potatoes, hides and skins, minerals, especially copper and zinc, timber, and wool.



Tasmania. Map of the island once called Van Diemen's Land, a state of the Australian Commonwealth

The total value of imports in 1945-6 was £A 16 m., £A 14.7 m. being from Australia; principal imports were metals and machinery, clothing and textiles, food, drink, and tobacco.

There are 642 m. of state owned rlys., the main sections being between Hobart and Launceston, and Launceston to Burnie and Macquarie Harbour. There is one class on the rlys., which have been run for many years at a loss.

Tasmania has ten representatives in the Commonwealth senate, five in the Commonwealth house of representatives at Canberra, as well as its own parliament consisting of a legislative council of 19 members, elected for six years, and a house of assembly of 30 members elected for five years. There is adult suffrage and proportional representation with single transferable vote. There is a governor and a cabinet of nine.

The pop. in 1947 numbered 257,117. About 47 p.c. of the natural increase of the pop. is lost by migration.

The majority of schools in Tasmania are under the control of the state; primary education is free and compulsory from 7 to 14 yrs. of age. There are secondary schools in the larger centres of pop. and also in a number of rural areas to which the pupils from outlying districts are conveyed at public expense. Children who pass the necessary examinations can secure free education up to and including the university. The university of Tasmania, established in 1890, obtained a royal charter in 1915. Degrees are granted after examination in all the usual subjects except theology and divinity. The university is on a secular basis, no religious test being permitted.

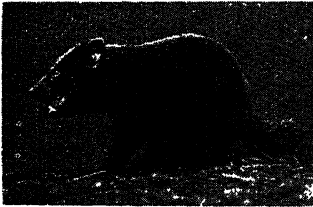
Hobart (pop. 72,155), near the mouth of the Derwent, is the capital. Its harbour is one of the finest in the world. Launceston (pop. 36,730) is a beautiful town on the Tamar. Burnie and Devonport are important ports.

Tasman, first European to reach the island, landed in Marion Bay in 1642; he named it Van Diemen's Land, in honour of the governor of the Netherlands E. Indies. Van Diemen's Land became British in 1803 as a settlement of New South Wales, and was made independent in 1825. In 1853 transportation of convicts to the island was abolished, its name was changed to Tasmania, and representative institutions (effective 1856) were granted. In 1901 Tasmania joined the Commonwealth of Australia.

There were some 5,000 aborigines, who had no close affinities among existing peoples, when white settlement began. The 203 left were deported in 1831 to Flinders I. where the last pure blooded Tasmanian man, Billy Lannee, died in 1865, the last woman, Truganini, in 1876. See Australia; Hobart. Consult Early Tasmania, J. B. Walker, 1914; The Aborigines of Tasmania, H. L. Roth, 1914; Wanderings in Tasmania, G. Park, 1934; Early History of Tasmania, R. W. Giblin, 1939; Walch's Tasmanian Almanac, annually.

Tasmania, UNIVERSITY OF. Educational centre at Hobart. Founded in 1890, it received a royal charter in 1915. The faculties are arts, science, law, and commerce, and there are laboratories, a library, and an observatory. It has about 500 students.

Tasmanian Devil (*Sarcophilus ursinus*). Name given by the original British settlers at Hobart to a marsupial mammal in consequence of its persistent raids on their poultry, etc. In size, short limbs, short muzzle, and bear-like feet it is not unlike the badger. It is a carnivorous animal of great strength, clad in thick, close fur of a black or blackish-brown hue, with white patches on the neck, shoulders, chest, and hinder parts.



Tasmanian Devil. Fierce marsupial peculiar to Tasmania and resembling a badger

Length is about 28 ins., to which the tail adds another 12 ins. The creature is fierce and untamable, and its powerful teeth, of which the canines are tusk-like, make it formidable. Like the badger, it lives in burrows, and is nocturnal. Three to five are born at a birth.

Tasman Sea. Portion of the S. Pacific Ocean. It occupies the 1,000-m. stretch between New Zealand and S.E. Australia, and was first sailed by Abel Tasman. It has a depth exceeding 15,000 ft.

Tassie, JAMES (1735-99). Scottish gem modeller. Born at Pollokshaws, Glasgow, July 15, 1735, he studied modelling at Foulis's academy. In combination with Henry Quin at Dublin he invented a vitreous paste for the reproduction of gems, and in 1766 he settled in London. Besides gems, he produced many portrait medallions cast in the same paste; these and the gems of his collection were catalogued by Raspe. Tassie died in London, June 1, 1799. See Foulis, R.; Smith, Adam.



James Tassie, Scottish gem modeller

Tassigny, JEAN DE LATRE DE (b. 1890). French soldier. After

graduating from St. Cyr, he served in the First Great War, being four times wounded. A general at the time of the defeat of France in 1940, he tried to get sent with his div., which had made a notable stand on the Aisne, to the U.K. or N. Africa. Condemned in 1942 to 10 yrs.' imprisonment for opposing the German invasion of unoccupied France, he escaped Sept., 1943, and joined de Gaulle. He commanded the French force that liberated Elba, and the French contingent that landed in S. France, Aug. 15, 1944, liberated Marseilles and Toulon, and with the French 1st army freed Alsace and conquered S.W. Germany. First French representative on the Allied control commission for Germany, June-July, 1945, he then became inspector-gen. of the French army until appointed Oct. 4, 1948, c-in-c. land forces Western Europe.



J. de Latre de Tassigny, French soldier

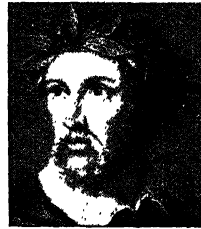
Tasso, TORQUATO (1544-95). Italian poet. Born at Sorrento, March 11, 1544, the son of a nobleman of Bergamo in the service of the prince of Salerno, he was brought up in Naples, receiving his education from the Jesuits. His father, Bernardo, a victim of political upheaval, had taken refuge in Rome, where, on the death of his mother in 1556, Torquato joined him. They proceeded to Urbino, where Torquato grew up in a literary and artistic atmosphere, and in 1562 completed his first narrative poem, Rinaldo, which established his reputation. Given a post in the retinue of Cardinal Luigi d'Este at Ferrara, in 1565, he soon became the central figure at that court.

In 1571 he entered the court of Alfonso II, duke of Ferrara. Two years later appeared *Aminta*, an exquisitely written pastoral drama, and in 1574 he completed the epic, *Gerusalemme Liberata*. This was long unpublished owing to the conflicting criticisms and suggestions made by those to whom he showed the MS. Discontented with his court position and disappointed at the adverse comments on his great

work, Tasso sought to leave Ferrara, but Alfonso refused his permission, and the poet remained virtually a prisoner until he escaped to Sorrento in 1577.

After two years' wandering he returned to Ferrara, where the duke, alleging his insanity, shut him up in the bedlam of St. Anna for seven years. While in confinement Tasso heard that his *Gerusalemme* was being published from the MS. taken from him when he was imprisoned, and the whole work appeared without his seeing so much as a page or receiving so much as the price of a copy. All his sonnets and odes were likewise published with emendations by minor poets such as Guarini. In 1586 he was released, and after passing a few months at the Gonzaga court at Mantua, began once again his life of wandering between Rome, Naples, and Florence. He settled in Rome, in 1594, at the invitation of Cardinal Aldobrandini, now, after weary years of homelessness, an honoured guest; but the end came before he could enjoy his prosperity, and he died at the convent of S. Onofrio, April 25, 1595.

The great epic of *Gerusalemme Liberata*, *Jerusalem Delivered*, about the First Crusade and the capture of Jerusalem by Godfrey (q.v.), of Bouillon contains twenty cantos, each of about 100 eight-line stanzas. Added to melodiousness and pathos is the attractiveness of the love stories of its heroines, Armida, Erminia, and Clorinda. The best English translation is by J. H. Wiffen, 1830. There are *Lives of Tasso*, in Italian, by P. A. Serassi, 1790; A. Solerti, 1895; consult also T. and His Times, W. Boulting, 1907.



After a print by Raphael Morghen

Tassoni, ALESSANDRO (1565-1635). Italian poet and critic. Born at Modena, he came into notice in 1609 by a critical disquisition on Petrarch, in which he boldly questioned the accepted authorities in matters of taste. He entered the diplomatic service of Charles Emmanuel, duke of Savoy. His principal work is a mock heroic epic in twelve cantos, *La Secchia Rapita*, 1622, Eng. trans., *The Rape of the Bucket*, by J. Ozell, 1715, and republished 1918; it records an incident of the 13th century wars between Modena and Bologna.

Taste. One of the five senses. The organs of taste are the tongue and soft palate. The mucous membrane of the tongue has scattered over it papillae of various forms and taste-buds which contain gustatory cells in close association with nerve fibres. The nerve of taste is the glossopharyngeal nerve. Tastes are classified into sweet, bitter, acid or sour, and salt. Sweet tastes can be best detected at the tip of the tongue, acid tastes at the sides, and bitter tastes at the back. *See Tongue.*

Tata, JAMSETJEE NASARWANJEE (1839-1904). Indian industrialist and philanthropist. A Parsee of Baroda, he was educated at Elphinstone College, Bombay. After successes in the cotton trade he turned his attention to developing the resources of the Central Provinces, and adapted the Japanese silk manufacture for its introduction into Mysore. He built and endowed the research institution at Bangalore. Tata died May 19, 1904.

His son, Sir Dorabji Jamsetjee Tata (1859-1932), developed the family cotton mills, discovered with S. Saklatvala a vast deposit of iron in Orissa, which formed the basis of his iron and steel works at Jamshedpur, and introduced hydro-electric installations in the W. Ghats to bring power to Bombay. Knighted in 1910, he endowed charities to the extent of £2,000,000.

Tatar or Tartar. Autonomous republic of the R.S.F.S.R. Created in 1920, it has several other autonomous republics on its borders and lies on both sides of the Volga and Kama rivers. With a continental climate, it has much fertile land in the S. with forest or marsh elsewhere. Kazan, the capital, is a manufacturing centre, and leather work is a traditional occupation of the Tatars or Tartars who make up half the pop. Area approx. 25,950 sq. m. *See Tartar.*

Tatar Pazardzik. Town of Bulgaria, in Eastern Rumelia. It is situated on the Maritza, 74 m. S.E. of Sofia on the railway to Constantinople. The place was founded by Tartars in the 15th century.

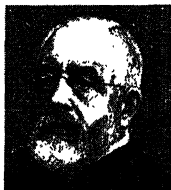
Tate, HARRY (1872-1940). Professional name of Ronald Macdonald Hutchison, British comedian, born July 4, 1872. From the sugar-refining firm which employed him he took this name. On April 13, 1895, he went first on the music hall stage at the Oxford,

beginning as a mimic. Later sketches on such subjects as motoring, fishing, golfing, and



Harry Tate, British comedian, and (right) wearing the famous moustache of his stage make-up

wireless were in the robust Victorian tradition of comedy to which Tate's make-up, especially his moustache, added much. He appeared in pantomime and revue, received the royal command to figure in the first of such performances in 1912, and was an early broadcaster. British dominions and the U.S.A. saw his acts. In one of the first air raids of 1939 he was injured by a flying particle in a Dundee street, and he died Feb. 14, 1940.



Sir Henry Tate, British merchant

he embarked on a commercial career, and while employed in a sugar refinery at Liverpool, patented a device for cutting sugar loaves into small cubes for household use. This made his fortune and that of the firm of Henry Tate & Sons (later Tate and Lyle). A generous benefactor to hospitals, public libraries, and to University College, Liverpool, he was also a judicious collector of modern pictures, and about 1890 decided to give to the nation his private collection at Streatham. After prolonged negotiations a site at Millbank was selected on which the now famous Tate Gallery (*q.v.*) was erected at his expense. In 1898 he was made a baronet; he died Dec. 5, 1899.

Tate, MAURICE WILLIAM (b. 1895). English professional crick-

eter, born April 29, 1895, son of Fred Tate, Sussex and England player. He first appeared for the same county in 1912. During 1924-30 he was chosen for every test match against Australia, and went in at every position in the batting order, but was primarily a fast-medium bowler of great endurance, whose collection of 38 wickets in one series of tests, 1924-25, was a world record. Tate scored a century against the S. Africans in 1929. In the English season 1925 he took 228 wickets for less than 15 runs each.

Tate, NARUM (1652-1715). Irish poet and dramatist. He was born in Cavan and educated at Trinity College, Dublin. His dramatic work was mainly that of an adapter or collaborator, his most notorious adaptation being that of King Lear. *Panacea* or *a Poem on Tea* is his only notable original poem. *New Version of the Psalms*, published 1696, were made in collaboration with Nicholas Brady (*q.v.*). Tate was appointed poet laureate in 1692, and died in poverty at Southwark, Aug. 12, 1715.

Tate Gallery. Art gallery at Millbank, London, S.W.1. Sir Henry Tate (*q.v.*), who owned a collection of 65 paintings, offered them to the nation with £80,000 for a building, if the govt. would provide the land. This offer was accepted in 1892, and the gallery built on the site of Jeremy Bentham's model prison; it was opened July 21, 1897. Sir Francis Chantrey left to the Royal Academy a large fortune for the establishment of a collection of British art, 1841, and this, together with the Tate collection, as well as 157 works by British artists be-



Tate Gallery, London. The Thames-side art gallery at Millbank, given to the nation by Sir Henry Tate

queathed to the nation by Robert Vernon, 1847, and 233 paintings of the British school left by John Sheepshanks to S. Kensington museum, 1857, provided the nucleus of the collection. Other pic-

tures were presented by various art societies. Nine new galleries, the gift of Sir Joseph Duveen (*q.v.*), were built to exhibit the Turner collection and opened 1910, and in 1919 the original purpose of the gallery was widened to include British art of all periods: 200 pictures were accordingly transferred from the National Gallery. Further galleries were erected in 1916 and 1937. Thirty-nine modern foreign masterpieces were added under Sir Hugh Lane's will, 1915, and Samuel Courtauld gave the trustees £50,000 for the purchase of paintings by Manet, Monet, Degas, Renoir, Sisley, Gauguin, and Van Gogh, 1925. Further extensions were opened by George V, June 26, 1926. By 1948 the collection had more than 3,000 works by British sculptors and painters and 500 by foreign artists. The gallery is governed by trustees with a director and keeper.

The basement of the gallery was flooded during the exceptionally high tide of Jan. 7, 1928, when the Thames burst its banks, and a number of pictures were damaged. At the outbreak of the Second Great War the contents of the galleries were removed to a place of safety. In 1941 the buildings were badly damaged by bomb blast and more than 50 incendiary bombs. Six rooms had been reopened by 1948. After 1939 purchasing policy became extremely catholic, purchases including works by Henry Moore, John Piper, Eric Ravilious, and Matthew Smith: contemporary foreign artists represented included Paul Klee, Max Ernst, and Marc Chagall. Post-war exhibitions of the works of Van Gogh and Chagall attracted large crowds. Selected British works from the gallery were exhibited in foreign cities by arrangement with the British Council. In 1948 the director was John Rothenstein (*q.v.*).

Tateyama OR TACHAIYAMA. A Japanese mt., in the island of Honshu. One of the principal summits in the country, it culminates in a wedge-shaped point, Oyama, at an alt. of 9,186 ft. There are solfataras and extinct craters near the summit. The shrine, situated amid perpetual snows, is visited by pilgrims between July 20 and Sept. 10. The view from the peak is spoken of as the most extensive in Japan.

Tatian (c. 110–180). Christian apologist. A native of Mesopotamia, he became a wandering teacher of philosophy and rhetoric. Converted to Christianity about

150, he settled in Rome, became a disciple of Justin Martyr, and wrote an oration to the Greeks, attacking pagan religion. He travelled widely as a missionary in the East. After Justin's death he developed Gnostic and excessively ascetic views, and was denounced as a heretic. His Diatessaron, a gospel harmony, based on the Syriac versions, was held in high esteem.

Tatler, THE. English periodical, mainly consisting of essays. Begun by Sir Richard Steele (*q.v.*), April 12, 1709, it was continued thrice weekly until Jan. 2, 1711. After a time Steele was joined by Joseph Addison (*q.v.*). Though Steele began with an air of providing news, after Addison joined with him the work soon changed into light, suggestive, descriptive, and humorous social essays. The Tatler was supposed to be one Isaac Bickerstaff, a name which had also been used as a pseudonym by Swift. Of the 271 Tatlers, Steele wrote 188, Addison 42, and the two in collaboration 36. See *Spectator*, THE.

Tatler and Bystander, THE. London weekly illustrated paper. The Tatler was started by Clement Shorter on July 3, 1901, and absorbed The Bystander in 1940, the first number with the new title appearing Nov. 6 that year. Society, sport, and stage are the subjects favoured, in articles, gossip paragraphs, and photographic snapshots.

Tatra Mountains OR THE HIGH TATRA. Central section of the Carpathians. It lies across the boundary of Czecho-Slovakia and Polish Galicia. It includes the culminating peaks in the range, the highest being the Gerlisdorfer Spitze, 8,737 ft.; others are Lomnitzer Spitze, 8,642 ft.; Eisthaler, 8,630 ft.; Tatra Spitze, 8,415 ft.; and Meeraugen Spitze, 8,210 ft. Precipitous rockwalls rise sheer above the valleys of the Vag and Poprad, and the lower slopes are covered with coniferous forests.

Tattersall's. Racehorse auction mart and subscription rooms in London. It was established near Hyde Park Corner in 1766 by Richard Tattersall (1724–95), who had been stud-groom to the second duke of Kingston. He was known as Old Tatt, to distinguish him



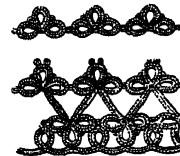
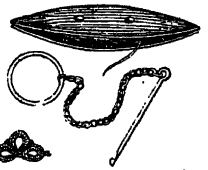
Richard Tattersall, breeder of racehorses

from later well-known members of the family. The establishment was

removed to new premises in Knightsbridge in 1865. Two subscription rooms were reserved for members of the Jockey Club and formed the meeting place of the principal bookmakers and backers. Weekly betting settlement took place here. In 1948 the Knightsbridge premises were sold to Oetzmann and Co., furnishers. See Betting.

Tattershall. Village in the Lindsey div. of Lincs, England. It is 7 m. S.S.W. of Horncastle, and is famous for its castle. This was built by Ralph, 4th baron Cromwell, in the 15th century, on the site of an earlier one, and was partially destroyed in the Civil War. In the 20th century it was restored by Lord Curzon, who bequeathed it to the nation. It is regarded as one of the finest existing examples of a fortified dwelling in England. The church of Holy Trinity contains tombs of the Cromwell family and some fine brasses. There is a village cross. Pop. 398.

Tatting. Knotted lace made of linen or cotton threads by means of a shuttle. By constantly twisting this through and over a loop of cotton held round the fingers,



Tatting. Pattern of knotted threads; top, right, shuttle ring, and pin

small rings of tightly knotted thread are made. A small hooked pin, attached to a ring that passes

over the left thumb, is employed to draw through the thread when fastening two such rings together.

Tattoo. Military term used in two senses. (1) Bugle call or beat of drum formerly used at nightfall to summon troops to their quarters. The word is derived from the Dutch *taptoe* (put the) tap to, and was originally a signal to warn innkeepers to sell no more liquor to soldiers. In the British army tattoo is now generally sounded for lights out, and varies in different branches of the service. Beating tattoo is sometimes a ceremonial evening parade, the buglers and drummers marching up and down, and concluding with the last post. (2) Military tournament and pageant, especially the shows at Aldershot and Tidworth staged annually by the British army.

Tattooing (Tahitian *tatau*, markings). Practice of producing durable designs under the human skin with the aid of pigments. Undertaken from motives of personal adornment or sex attraction, and for amuletic, ritual, or informative purposes, it is effected by puncturing or cutting the skin, and introducing charcoal powder or other colouring matters and ingredients. It should be distinguished from the scarring or scar-tattooing of many dark-skinned peoples, especially in Melanesia and negro Africa, which forms sunken or raised cicatrices, usually without artificial pigmentation.

The body-painting of primeval man apparently passed into tattooing as a means of securing durable designs. Ritual cutting and puncturing, evidenced in the middle Egyptian kingdom, and forbidden to the Jews by Lev. 19, spread with ancient mariners to S.E. Asia and the Pacific, where it became a fine art in recent centuries.

In Burma the complete decoration of the trunk and lower limbs is now passing away. As among the Shans, whose designs are extended from neck to feet, Burmese work is uniformly blue-black, except love-spells and devices to ensure immunity from wounds and disease, which are usually vermilion. Brass styles, with four or eight prickers, are applied by pressure. Japanese tattooing, always more artistic, and formerly prevalent among the lower classes as a partial substitute for clothing, has almost died out. Elaborate designs, sometimes of textile origin, occur in the Philippines, Borneo, and New Guinea. Polynesian tattooing is effected by tapping serrated tools with mallets. For the moko tattooing of the faces of Maori chiefs smooth-edged adzes were employed. The puncturing of simple and local designs for social or ritual purposes is widespread. Eskimo women stitch blackened threads into the skin.

Tattooing, as adopted by European seamen, comprises Oriental designs such as dragons, besides ships, anchors, and amatory tokens. London and New York practitioners tattoo upon their patrons reproductions of sacred, military, and hunting scenes, regimental emblems, and the like. Electric needles, and a wide range of colours, are employed. *See* Ainu; Maori.

Ta-tung-kau. Former treaty port in Liaoning prov., Manchuria. It stands at the mouth of the Yalu river, and was opened to foreign trade in 1907. Pop. 12,581.

Tau or **St. ANTONY CROSS.** In heraldry, the crutch-shaped or Greek T (tau) cross. *See* Cross.

Tauber, RICHARD (1892-1948). Austrian-born British singer. He was born at Linz, May 16, 1892, studied music at Frankfurt, and made his debut, 1913, at Chemnitz, singing the part of Tamino in *The Magic Flute*. He appeared in tenor rôles at Dresden, Berlin, and Vienna; then turned to operetta, his first appearance in this type of production being in Vienna in *Frasquita*, 1923. When he first came to London in *The Land of Smiles*, 1931, the song *You Are My Heart's Delight* became the most popular in his repertoire: it was reported that he sang it more than 10,000 times. He composed the music for *Paganini*, 1937; *Old Chelsea*, 1943. Of his musical films, the most popular was *Blossom Time*, 1934. Tauber, who had married as his second wife the actress *Diana Napier*, became a naturalised British subject in 1940. He died Jan. 8, 1948.

Taumnitz, KARL CHRISTOPH TRAUCCOTT (1761-1836). German publisher. Born near Grimma, Oct. 29, 1761, he began printing books in 1796, at Leipzig. His editions of Greek and Latin classics were widely famed for cheapness and accuracy. He died Jan. 14, 1836, when his business was

German works. He died at Leipzig, Aug. 13, 1895, and was succeeded by his son, Baron B. von Taumnitz (1841-1921). The business was sold in 1934 to the firm of Brandtetter.

Tauler, JOHANN (c. 1300-61). German mystic. He was born at Strasbourg, and at the age of 18 became a Dominican friar. He won great fame as a preacher and exercised a wide influence. He died June 16, 1361. Tauler's sermons, published after his death, rank high in devotional literature. *See* Mysticisim.

Taunags Skull. Skull of an ape found in S. Africa in 1925. It approaches that of a child, but on the whole rather resembles that of a young chimpanzee. *See* Man.

Taunton. Mun. bor. and co. town of Somerset, England. It stands on the Tone, 143 m. S.W. of London and 45 m. by rly. S.S.W. of Bristol. The chief buildings are the churches of S. Mary Magdalene and S. James, both dating from the 15th century, the former a large and beautiful Perpendicular building with a tower 153 ft. high; shire hall, town hall, market house, and hospital. The castle, which is now a museum, was built in the 12th century, but much of the existing building dates from the 15th. There is a grammar school founded in 1522, and a public school. Cider, gloves, shirts, and agricultural machinery are manufactured, and the town is an agricultural centre of some importance.

Taunton existed in the 8th century and was a borough with a market before the Norman Conquest, although the present charter of incorporation only dates from 1877. It elected two M.P.s 1299-1832, then one until 1885. It now gives its name to a co. constituency. Taunton is the seat of a suffragan bishop, under the bishop of Bath and Wells. The castle was held by Blake during the Civil War, and in 1685 Monmouth was proclaimed king here. Taunton Deane, the valley in which Taunton stands, is very fertile. Market days, Wed. and Sat. Pop. 31,150.

Taunton. City of Massachusetts, U.S.A. The co. seat of Bristol co., it stands at the head of navigation on Taunton river, 37 m. S. of Boston, and is served by the New York, New Haven and Hartford rly. Taunton has machine



Taunton borough arms



Taunton, Somerset. Church of S. Mary Magdalene, from the south-east
Firth

carried on by his son, Karl Christian (1798-1884). The elder Taumnitz's nephew, Christian Bernhard, born at Schleinitz, Aug. 25, 1816, founded the better-known Taumnitz publishing house in 1837, from which more than 4,000 vols. by British authors have been issued. He also published other series of English, French, and

shops, and manufactures cotton goods, jewelry, electrical apparatus, pewter ware, and stoves. It was settled in 1638, incorporated in 1639, and became a city in 1864. In the first half of the 19th century it rivalled Boston, with more than 200 industries. Pop. 37,345.

Taunton, HENRY LABOUCHERE, 1st BARON (1798-1869). British politician. Descended from a Huguenot family, he was born Aug. 15, 1798. His father, Peter C. Labouchere, was a banker from Amsterdam, who settled in England, while his mother was a Baring. Educated at Winchester and Christ Church, Oxford, he entered parliament in 1826 as M.P. for a Cornish borough, and in 1832 he took office in the Whig govt. filling minor posts until 1839. As a cabinet minister he was president of the board of trade 1839-41, and again 1847-52; and secretary for the colonies 1855-58. For a short time (1846-47) he was also chief secretary for Ireland. In 1859 he was made a peer as Baron Taunton, a town he had represented in parliament since 1830. The title became extinct when he died, July 13, 1869. Henry Labouchere (*q.v.*) was his nephew.



1st Baron Taunton,
British politician
After Slater

Taurus. Mountain range of Germany in Hesse. It stretches N.E. for 45 m. from the right bank of the Rhine between Mainz and Bingen and culminates in the N.E. at 2,887 ft. in the Great Feldberg. The crags overlooking the Rhine are crowned with ruined castles and are vine-clad on the slopes. Forests clothe the higher parts of the range, which contains, among others, the mineral springs of Wiesbaden, Homburg, and Nauheim.

Taupo. Lake of North Island, New Zealand. It lies in the volcanic region containing Ruapehu, Ngauruhoe, and Tongariro, and is 241 sq. m. in area, 1,211 ft. alt., and 534 ft. deep. Taupo is also the name of a township on the lake and Waikato river, 227 m. by rly. S.E. of Auckland; it has medicinal and hot springs.

Tauric. Cape forming the S.W. point of the Crimea, R.S.F.S.R. It is 7 m. W. of Sevastopol. On this promontory formerly stood the Greek city of Chersonesus.

Taurt or **Touaris** (Egypt., the mighty one). Egyptian deity.

Represented as a hippopotamus in calf, sometimes crowned with disk, horns, and plumes, she was a primitive animal-goddess, afterwards included in the theogony as consort of Set and, in the Theban form Apet or Opet, as mother of Osiris. As the "good nurse" she presided at childbirth, and as devourer of the wicked waited in Amenti for those who failed when weighed in the scales of judgement.

Taurus or **THE BULL**. In astronomy, one of the signs of the Zodiac. Originally the first sign, it is now the second, the sun entering the constellation about April 22. The Pleiades mark the shoulder of Taurus, the Hyades its head. The chief star is Aldebaran or Alpha Tauri, a red star some 90 times brighter intrinsically than the sun. The constellation contains a number of variable stars, and the well-known Crab nebula. See Constellation; Zodiac.

Taurus. Mountains of Asiatic Turkey. Consisting chiefly of two ranges, named by the Turks the Bulgar Dag and the Ala Dag, they run almost parallel to the coast of S.E. Asia Minor, forming the edge of the Anatolian plateau. On the E. they form the border between Asia Minor and Turkish Syria, the connecting pass being the Cilician Gates. The loftiest peak is the Metdesis, N.W. of Adana, and 11,500 ft. in height. The Anti-Taurus is an extension



Taurus. Mountain range of Asia Minor, presenting a steep scarp to the Cilician plains at the N.E. corner of the Levant

N. from the E. end of the Taurus. On a northern spur is Mt. Argacus, 11,480 ft., the highest point in Asia Minor. The Bagdad rly. follows the break between the Bulgar Dag and the Ala Dag.

Tavastehus (Finnish Hämeenlinna). Capital of the dept. of Häme in S.W. Finland. About 80 m. N.E. of Abo (Turku), it is connected with Leningrad by the Helsinki rly. The chief occupations are the cultivation of grain, flax, and hemp, and cattle breeding. Jean Sibelius (Egypt., the mighty one). Egyptian deity.

Tavern (Lat. *taberna*). House of wayside rest and refreshment. Synonymous with inn, the tavern has the same legal status, both in common law and by statute. But in trade and tradition alike, it is the public house, providing alcoholic drink and sometimes "soft" drinks, and food, rather than the hotel furnishing accommodation. The tavern was created by and for the needs of the road. Unknown to primitive or savage communities, its history is nevertheless both ancient and respectable. It figures in the earliest literature of China and Japan, India, Assyria, Persia, and Egypt, also in the Bible. In ancient Greece its status was not high, but the Roman road makers set great store by their taverns, controlling them by legislation, much of which has been incorporated in modern laws. Cicero mentions Tres Tabernae (three taverns) as a town on the Appian Way. Shakespeare's Mermaid Tavern and Johnson's Cheshire Cheese have been immortalised, and the tavern of Omar Khayyam remains a symbol of life's pilgrimage.

Taveta. Settlement of Kenya Colony (*q.v.*). It is 75 m. W. of Voi on the Uganda rly., and 28 m. E. of Moshi on the Usambara rly., and is close to the frontier of Tanganyika Territory, near the N.E. slopes of Mt. Kilima-Njaro, 2,350 ft. above sea level. In 1884

Sir H. Johnston concluded treaties here with the local chiefs, and a little later the German Karl Peters, and General Lloyd Matthews, the latter acting for the sultan of Zanzibar, also made treaties with the same chieftains. The place was allotted to the British, but the greater part of Kilima-Njaro fell to the Germans. The dist. was the scene of numerous encounters during the First Great War.

Tavira. Seaport of Portugal, in the prov. of Algarve. It is 136 m. S.E. of Lisbon on the river

Gila, and has a Moorish citadel and a Renaissance church. The harbour, guarded by two forts, is accessible to small vessels which trade in fruit, tunny, and sardines. Pop. 14,000.

Tavistock. Market town and urban dist. of Devon, England. It stands on the Tavy, 15 m. N. of Plymouth, and is served by rlys. A short canal leads from here to the Tamar. The chief buildings are the church of S. Eustachius, dating from the 14th century, and the



TAVISTOCK ARMS

guildhall and other public offices. Educational institutions include an endowed grammar school and Kelly College. Formerly a stannary town, Tavistock was the centre of an important mining district. It was also famous for its woollens and much cloth was sold at its fairs, but it is now chiefly an agricultural centre. It elected two M.P.s 1295-1867, then one until 1885. It now gives its name to a co. constituency. There are remains of a monastery founded in 961, around which the town grew. This became very rich, a fine building being erected for it in the 15th century. On the dissolution of the monasteries its lands were given to John Russell, whose descendants, the dukes of Bedford, had a seat, Endsleigh, near the town. The eldest son of the duke has the title of marquess of Tavistock. Market day, Fri. Pop. 6,024.

Tavistock Square. London square, in the bor. of St. Pancras, W.C.1. It was built about 1806 on property of the duke of Bedford and named after his heir the marquess of Tavistock. At Tavistock House (demolished 1901) Dickens during 1850-57 wrote *Bleak House*, *Hard Times*, and *Little Dorrit*; he also set up a small theatre in the garden. The E. side of the square, in Woburn Place, is occupied by the appointments office of the ministry of Labour; buildings of the British Medical Association are at the N.E. corner; while on the N. side stand the Jews' College and the headquarters of the Free Church Federal Council.

Tavoy. Dist., harbour, and river of Burma, in the Tenasserim division. The dist. is the coast strip W. of the mountainous Siamese frontier. It has the very heavy rainfall of 227 ins. annually. Hardly any of the land is culti-

vated, a little rice being grown. Wolfram and tin are mined. Tavoy town, 30 m. from the mouth of the river, is well laid out, and timber-built. It is almost in the middle of the coast of the dist. on the E. side of the long narrow estuary of the Tavoy river, a short stream which flows due S. from the N. of the dist. Area, 5,308 sq. m. Pop., dist., 211,729: town, 37,650.

Tavy. River of Devon, England. It rises on Dartmoor and after a course of 20 m. falls into the Tamar. Its estuary is 3 m. long and about $\frac{1}{2}$ m. broad. Tavistock is on its banks, and the river also passes Buckland Abbey.

Taw. River of Devon, England. Rising on Okement Hill, in Dartmoor, it flows N.E. to Lapford, and turns N.W. to Barnstaple at the head of its estuary. Its length is 50 m.

Tawe. River of Wales. Rising in Brecknock, it flows for 36 m. S.W. through Glamorgan to Swansea Bay at Swansea.

as a citizen may enjoy services worth to him much more than he has to pay as taxes.

Every tax is of persons, not things, however it may be expressed. When consumers of goods are taxed by means of duties, e.g. customs and excise duties, on the commodities they buy, the tax is called indirect. Taxes on income and property, on particular classes of people (e.g. auctioneers), and on acts (such as writing a cheque or a receipt) are direct.

Taxation is one of the principal instruments by which a government expresses its policy, and a tax may be most effective when it produces least revenue: for example, protective taxes on imports, or taxes on alcohol imposed to discourage drinking, are entirely successful when they produce no revenue.

Throughout the ages taxation has aroused hostility, and at times has caused rebellion and civil war. Now most people, in



Tavistock, Devon. The Guildhall, built in 1848 and incorporating remains of the Benedictine Abbey
Frith

Tawell, JOHN (d. 1845). British murderer. He was hanged in 1845 for the murder at Slough of Sarah Hart, whom he poisoned with prussic acid. The crime is memorable for the ingenious defence that the prussic acid was contained in apple pips eaten by the dead woman, and for the fact that Tawell, who escaped to London, was intercepted at Paddington as the result of a telegram from Slough—the earliest use of the telegraph for tracing a wanted criminal.

Taxation (Lat. *taxare*, to compute). Term for the levying of contributions from citizens for the maintenance of the state. A tax is not a direct payment for services provided; thus, a 6d. stamp on an agreement is a tax, a 6d. stamp on a parcel is not. A taxpayer

the U.K. at any rate, regard it as a necessary evil. Four maxims, or canons, of taxation, stated by Adam Smith in his *Wealth of Nations*, 1776, repeatedly quoted and adapted to changed conditions, are: (1) that people should contribute in proportion to their ability; (2) that a tax should be certain, in form, amount, and manner of payment; (3) that the tax should be levied in the most convenient way; (4) that it should be so contrived as to take out and to keep out of the pockets of the people as little as possible more than it brings to the Treasury. These four canons of equality, of certainty, of convenience, and of economy are frequently used to judge the quality of a proposed tax. Thus, a poll-tax (a fixed amount per head) violates the

first canon; so does an income tax at a flat rate irrespective of the size of the income, for each unit—pound, dollar, franc, etc.—of a small income has generally a much greater significance than each unit of a very large income.

Most customs and excise duties violate all the canons except the third; for experience suggests that most people object less to paying taxes on expenditure than taxes on income, notwithstanding that when imposed on *e.g.* household necessities, commodity taxes press much more heavily on the poor than on the rich, that few people know how much tax is included in the price they pay, and that generally the extra amount paid for the taxed goods is very much larger than the tax. A psychological reason for this preference is the citizen's knowledge that if he cares to do without the taxed article he can avoid paying the tax, a choice he cannot make where direct taxes are concerned.

Bad Forms of Tax

A govt. in devising its taxation has to subordinate precept to expediency, and especially has to seek taxes that are elastic, that is, can be adjusted by altering the rate in order to produce more or less as may be desired. Any tax, however, is bad if it produces results quite unexpected and undesired, as did the taxing of the American colonies under George III, or if it tends to impoverish the whole community by lowering the standard of health or by lessening economic activity and initiative. One method of taxing is always bad: that of financing govt. expenditure by depreciating the currency through the issue of bank notes. An easy and insidious form of taxation, it has during the 20th cent. caused immense harm on the Continent, especially in Germany and France.

Since the middle of the 19th cent. there has been in most countries a great increase in taxation, partly because the state has undertaken many additional functions, but principally because of the vastly increased cost of war and defence, and the interest on debts resulting from war. There has also been a tendency in the U.K., and to some extent in other countries, to rely much more on various forms of direct taxation, particularly taxes on income. In 1840–50 direct taxes in the U.K. supplied only 30 p.c. of the total revenue; at the beginning of the 20th century they provided about

50 p.c., by 1913 60 p.c., by 1920 nearly 70 p.c. In 1932 the range of customs duties was greatly increased, and at the outbreak of the Second Great War direct taxes accounted for about 60 p.c. As the war proceeded, the great increase in indirect taxes, chiefly the newly introduced purchase tax, was more than offset by the still greater increase in the rates and the range of direct taxes, and only about one-third of the total tax revenue was raised through duties on goods.

The growth of taxation in the U.K. has been partly caused by the greater willingness of all political parties to use taxation as a social and economic instrument. Most British govts. would not hesitate to increase or decrease taxation if they considered that they could in that way prevent a slump and unemployment. The effect of high rates of taxation on prices, wage demands, the willingness of people to work hard or to undertake commercial risks, etc., has also been studied with considerable divergence of conclusions. See Customs and Excise; Income Tax; Single Tax; Surtax, etc.

H. Watson

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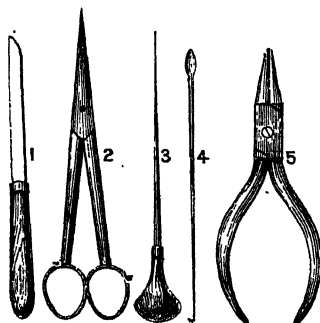
Taxation of Costs. In English law, the scrutiny by officials of the high court of justice and others of a solicitor's bill of costs. The work is done by masters of the supreme court, which has a taxing office, registrars of the county courts, and

clerks of the peace. All items are checked according to the allowed scale of costs, those charged wrongfully being disallowed and overcharges rectified. See Costs.

Taxco. Town of Mexico, in Guerrero state. Here was mined the first silver shipped to Spain from Mexico. Borda, a Frenchman, made an immense fortune in the 18th cent. from silver mining and founded the magnificent church crowning the hilltop. The town is a Spanish colonial gem, full of picturesque scenes, and the Mexican govt. has made it a national monument, prohibiting the construction of modern buildings. There are several good hotels, however. Taxco is about 130 m. N. of the port of Acapulco and connected to it by rly. Pop. 6,000.

Taxicab or TAXI. Popular name for a hackney carriage provided with a taximeter (*q.v.*). In England taxicabs are licensed by the local council of the district in which they ply, except in London, where they are licensed by the commissioner of police, and regulated by the London cab orders issued by the Home secretary. They must conform to certain requirements in design and safety measures, and are limited as to the number of passengers they may carry. Unlike the owner of a privately hired car, the taxi owner may charge only the amounts indicated on the taximeter. Normally the London taxi is licensed to carry four passengers, but in 1927 two-seater taxicabs were licensed by Sir W. Joynson-Hicks (later Lord Brentford), and after him were nicknamed Jixies; but these never proved popular and soon disappeared.

Taxidermy. The art of preparing, stuffing, and mounting the skins of animals to resemble the living creature. It is an exclusive and highly specialised craft; in England there are only two taxidermist firms, one a family concern in which experience is handed down from father to son. This firm is now owned by the founder's great-grandson, who is assisted by two brothers. The taxidermist's work is varied; not only does he stuff animals, but he fashions all kinds of articles from their skins. His showroom is an exhibition, with stuffed giant pandas, lions, tigers, lambs, dogs, cats, and other pets, monkeys, birds, amphibians, even insects and butterflies. The most important point is that a stuffed animal should be given a lifelike attitude: this calls not only for good craftsmanship, but



Taxidermy. Principal tools required for elementary work. 1. Skinning knife. 2. Scissors. 3. Bodkin. 4. Brain spoon and hook. 5. Round-nosed pliers.



Taxidermy. Stuffing a mandrill. 1. Studying the subject. 2. Softening the skin in a tank of water. 3. Stuffing the animal. 4. Shaping the body. 5. Fitting artificial eyes into the head. 6. Cleaning the fur with a comb. 7. The finished job. 8. A layer of arsenic having been applied to the face to ensure its preservation, a coating of plaster is laid on. This remains there for about two months until the face is completely dry and firmly set

also for artistic gifts and knowledge of natural history.

The process of stuffing is as follows: the skin, with the fur, if any, is immersed for softening in a water tank for several days, after which it is hung up for drying; at the next stage, iron rods are put into the limbs in order that the structure shall be firm; arsenic is applied where the skin is open, as these places are liable to rot; after these preparations, the animal is stuffed and the skull fitted into the head, the head itself being stuffed through the ear. The process of shaping follows, according to directions in a natural history book; artificial eyes are put into the skull (there is a factory in England which manufactures artificial eyes for all kinds of animals); the eyes are modelled for correct expression; the fur is cleaned with a comb; the mask is covered with arsenic and a layer of plaster of Paris, which is left on, sometimes for months, until the face is completely dry and set; finally the body is mounted and ready to be transported to a museum, school, or private house.

It is also the job of the taxidermist to make souvenirs of tusks, fins, hides, furs, elephant nails, etc., such as walking sticks

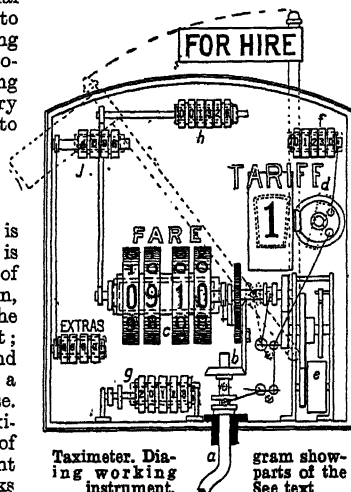
and ornamental tables from the skin of a hippopotamus, and ashtrays from elephant skin. As correct heat is necessary for stuffing different animals, the taxidermist's shop contains several rooms at varying temperatures. Patience, experience, and scientific knowledge are needed to transform the pitiful skin of a dead animal, with a dangling head, into a perfectly stuffed and mounted object which

gives a convincing illusion of life. Time necessary for completing the job varies from several weeks to months and even years, while the cost of stuffing a large animal like a hippopotamus or elephant may be several thousand pounds.

Simon Wolf

Taximeter. Device used on taxicabs to indicate payments due by the hirer. The inventor of the modern taximeter was A. Grüner, of Magdeburg, in 1895. The basic principle of the instrument lies in the fact that, for any complete revolution of a wheel of a vehicle, a certain distance is travelled by the vehicle. Hence, if the revolutions of the wheel be counted during a certain period, the distance travelled may be calculated. The accompanying figure shows the interior of an instrument. In this illustration *a* is a flexible shaft, the bottom end of which terminates in a wheel, which is geared with another on the nave of a wheel of the vehicle, and thus rotates as the vehicle travels. Through the gearing, *b*, the shaft is connected with the principal counter, *c*, the numbered disks of which are made to revolve by suitable gearing.

Apart from "extras," Grüner's original instrument provided for



five different tariffs. The parts are linked together in such a way that, by turning keys on the outside of the instrument case, the gears can be thrown in or out as required. In the diag. (p. 7965) the key, *d*, turned through a certain distance in one direction, will show tariff No. 1 (distance hire) at the tariff window, and at the same time connects the flexible shaft with the principal counter, *c*; turning the key in the other direction first disconnects the flexible shaft from the fare counter, and then connects the counter with the clock gear, *e*, and tariff No. 2 (time hire) simultaneously appears.

The counter, *f*, which is operated by the flagstaff being turned down, shows the number of times that the cab has been hired; *g* shows the total number of miles the cab travels; *h* the total amount paid for fares; while counter *j* adds up and records the amount paid for "Extras."

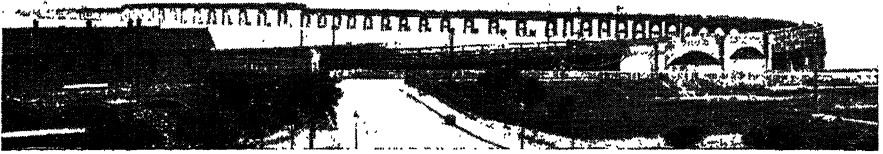
Taxodium. Summer-leaving tree of the family Coniferae. It is noted for the richness of the tints of its autumnal foliage. A native of N. America, whence it was introduced into Great Britain in 1640, it thrives in a moist, loamy soil, preferably by the edges of lakes or rivers, and is propagated in the ordinary way by seeds or cuttings, or by layering in the autumn. *T. distichum* is known as the bald or swamp cypress.

Tax Reserve Certificate. Certificate issued under a scheme introduced in the British budget of 1941. These are issued in multiples of £25 by the Bank of England on behalf of the Treasury to companies and others who deposit funds earmarked for the payment of income tax (other than schedules C and E), surtax, excess profits tax, and other taxes.

The certificates provide an investment for money that would otherwise remain probably as a deposit at the bank in readiness to meet the tax demand. Originally interest on such deposits was allowed at the rate of 1 p.c. free of tax, but in 1948 the rate was reduced to $\frac{3}{4}$ p.c. A tax certificate

Tay, Firth of. Indentation of E. Scotland on the North Sea. It is due to a submergence of the lower portion of the Tay valley, and extends inland 25 m. to Perth. See Inchcape Rock.

Tay Bridge. Railway bridge crossing the Firth of Tay. The first rly. bridge across the firth was



Tay Bridge. Railway viaduct, 2 miles and 73 yards in length, across the firth at Dundee. It was opened in 1887

is not transferable; but if the amount for which it is issued prove greater than the tax payable a balance certificate may be issued.

Tay. River of Scotland. It drains the greater part of Perthshire and portions of Angus, Argyllshire, and Inverness-shire, and has a length of 118 m., including its chief headstream and the Firth of Tay. Rising as the Fillan on Ben Lui, 3,708 ft., on the W. border of Perthshire, it flows E. by N. to Loch Dochart, whose name it takes, and then on to Loch Tay. On issuing from the N.E. end of this loch, it assumes its own name, and flows E. and S.E. past Aberfeldy and Dunkeld, and thence S. past Perth to the firth on the N. shore of which is Dundee. From the right it receives the Earn, Almond, Shoochie, and Bran, and from the left the Isla, Tummel, and Garry. The area of its basin is 2,400 sq. m., and it discharges more water into the sea than any other river in the U.K. Its salmon fisheries are the most important in Scotland.

Tay, Loch. Lake of Scotland, in W. Perthshire. It fills a rock basin in the valley of the Upper Tay, at an elevation of 349 ft. and with a depth reaching to 508 ft. In length 15 m. and breadth 1 m., it is an angling and tourist resort. Ben Lawers (*q.v.*) on the W. rises 3,635 ft. above the level of the lake.

opened in 1878, and Dec. 28, 1879, during a night gale, 13 of the main central spans, with a train upon them, fell 90 ft., a third of the bridge being destroyed, and all the passengers on the train, some 90 in number, being killed. The second bridge, built 1882-87 at a cost of £870,000, is just over 2 m. long and carries two lines of rly.

It was constructed within 60 ft. of the site of the original bridge, many of the smaller remaining girders of which were used in the new structure. For part of its length the rly. tracks are carried on top of the girders, but across the 13 main central spans the tracks are laid between the main girders so as to allow a clear height of 79 ft. for the passage of ships below. There are 74 spans, varying from 56 ft. to 245 ft. in length. The big spans were erected on pontoons alongshore and floated out to their positions at high tide. As the tide fell the girders were left resting upon low-level seatings on the piers, whence they were raised by hydraulic rams to the required level.

Taylor, ALFRED EDWARD (1869-1945). English philosopher. He was born Dec. 22, 1869, and educated at New College, Oxford. In 1891 he became a fellow of Merton, and during 1903-08 was professor of philosophy at McGill university, Montreal. In 1908 he became professor at St. Andrews, staying there until 1924, when he was appointed professor of moral philosophy at Edinburgh. He wrote many books on philosophical questions, being especially well known as an interpreter of Plato, Socrates, and the thinkers of Greece. Among his works were *Aristotle*, 1912; *The Influence of Platonism*, 1925; *Plato, the Man and his Work*, 1927; *The Life of Socrates*, 1933. A plea



Tay. One of the landing-stages on the Perthshire loch, from which excursions can be made to the surrounding mountains

for religion, *Does God Exist?* was widely discussed when it appeared just after his death, which took place Oct. 31, 1945.

Taylor, ALFRED SWAINE (1806-80). British medical jurist. Born at Northfleet, Dec. 11, 1806, and educated at Guy's and St. Thomas's Hospitals, then one institution, he became professor of medical jurisprudence at Guy's Hospital, 1831-77, being the first



Alfred Taylor,
British medical jurist

lecturer on the subject in England, and his profound knowledge and wide experience of poisons, wounds, etc., made him in constant demand at criminal trials. He died May 27, 1880. Taylor was the first man to codify medical jurisprudence, and his *Manual of Medical Jurisprudence*, first published in 1844, remains the standard work on the subject. He also wrote a *Handbook on Poisons*, 1848. See *Jurisprudence*.

Taylor, BAYARD (1825-78). American writer. Born in Chester co., Pa., Jan. 11, 1825, he was apprenticed to a printer, and in 1844 he published *Ximena*, his first volume of poems. He later went on a pedestrian tour of Europe, which he described in *Views Afloat*, or *Europe Seen with Knapsack and Staff* (1846). In 1847 he joined the staff of *The New York Tribune*, for which he travelled as special correspondent in California, Mexico, Egypt, Asia Minor, Syria, India, China, Japan, Greece, Sweden, and Russia. In 1862 and 1863 he was secretary of legation at St. Petersburg. Subsequently he spent many years in Germany, the fruit of which was his best known work, his translation of *Faust*, 1871. He died in Berlin, Dec. 17, 1878, while serving as ambassador.

Taylor, ISAAC (1829-1901). British philologist. A son of Isaac Taylor (1787-1865), author of *The Natural History of Enthusiasm*, he was born May 2, 1829, at Stanford Rivers. Educated at Trinity College, Cambridge, he was ordained in 1857. From 1865-69 he was a vicar at Bethnal Green and from 1869-75 at Twickenham. In 1875 he became rector of Settrington, Yorkshire, where he died Oct. 18, 1901. Taylor's fame rests chiefly upon his book, *The Alphabet*, 1883. His other works include the popular *Words and Places*,

1864. Taylor's aunt, Jane Taylor (1783-1823), won fame as a writer of hymns for children.

Taylor, JEREMY (1613-67). English divine and scholar. A barber's son, born at Cambridge, where he was baptized Aug. 15, 1613, he was educated at Gonville and Caius College, Cambridge, and University and All Souls Colleges, Oxford, becoming in 1636 a fellow of the last named. Chaplain to Laud and Charles I, he was rector of Uppingham, 1638; of Overstone, Northamptonshire, 1643. Taken prisoner at Cardigan, 1645, and deprived of his living by the Parliamentarians, he was for a time a schoolmaster in Wales, and chaplain to the earl of Carbery at Golden Grove, Carmarthenshire, where his chief works were written.

Charles II appointed him bishop of Down and Connor, 1661, and administrator of Dromore. He was vice-chancellor of Dublin university and a member of the Irish privy council, but disputes with the clergy, as a result of his strict episcopalianism, and domestic sorrow clouded his later years. He died at Lisburn, Aug. 13, 1667, and was buried in the cathedral he restored at Dromore.

Taylor's 36 separate works include *Episcopacy Asserted*, 1642; *The Liberty of Prophecy*, 1646;



Jeremy Taylor,
English divine

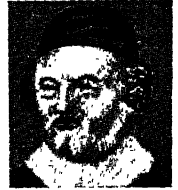
The Great Exemplar (Life of Christ), 1649; *The Rule and Exercises of Holy Living*, 1650; *The Rule and Exercises of Holy Dying*, 1651, both reissued in numerous editions; *Clerus Domini*, on the Ministerial office, 1651; *Unum Necessarium*, repentance, 1655; *The Golden Grove*, 1655, an expansion of an earlier Catechism for children, with hymns on the mysteries and festivals of the Church; *A Discourse on Friendship*, 1657; and *Ductor Dubitantium*, an erudite treatise on casuistry, 1660.

A man of remarkable erudition, influenced by the Renaissance, gifted with a fertile imagination, and the possessor of a stately and impassioned prose style rarely equalled and perhaps never surpassed by any English author, Jeremy Taylor, whose spiritual nature animates all he wrote, still exercises power and charm upon the appreciative reader.

Bibliography. Works, ed. R. Heber, with Life, 15 vols., 1822, rev.

ed. C. P. Eden, 10 vols., 1847-52; *Poems and Verse Translations*, ed. A. B. Grosart, 1870; *Lives*, J. Wheeldon, 1793; H. K. Bonney, 1815; T. S. Hughes, 1831; E. Gosse, 1904; G. Worley, 1907; W. J. Brown, 1925.

Taylor, JOHN (1580-1653). English writer, known as the *Water Poet*. Born at Gloucester, Aug. 24, 1580, and apprenticed to a Thames waterman, he served in the navy, being present at the siege of Cadiz, 1596, and at Flores, 1597. He returned to the Thames as a



John Taylor,
English writer
Bodleian Library

waterman, travelled, making a journey on foot from London to Edinburgh in 1618, and settled down in 1645 as an innkeeper in Long Acre. He was buried in the churchyard of St. Martin-in-the-Fields. His ruggedly racy writings, *Penniless Pilgrimage*, *Travels in Germany*, etc., upwards of 150 in number, were reprinted by the Spenser Society, 1869-78, and there is an account of him in Southey's *Observations on Uneducated Poets*.

Taylor, JOHN HENRY (b. 1871). English golfer. Born at Northam, Devon, March 19, 1871, he was for 46 yrs. professional to the Mid-Surrey club. He had a remarkable championship record spaced over more than 20 yrs., being open champion 1895, 1896 (jointly with Vardon), 1900, 1909, and 1913, and runner-up in 1904, 1905, 1906, 1907. In 1948, at the age of 77, Taylor was still a familiar figure at Walton Heath. His publications included *Taylor on Golf*, 5th ed., 1911; *Golf My Life Work*, an autobiography, 1947. With Vardon and Braid, Taylor ranks as one of the three greatest names in the early history of professional golf.

Taylor, MYRON C. (b. 1874). American lawyer and diplomatist. He was born Jan. 18, 1874, and took a law degree at Cornell. He did not establish himself primarily as a lawyer, but was concerned chiefly with finance. He was chairman of the finance committee of the U.S. Steel corporation,



J. H. Taylor,
professional golfer

1927-1934 and chairman during 1932-38, also holding directorships of many other large firms. He went as personal representative of F. D. Roosevelt to the Vatican during the Second Great War. Later he was chairman of the committee on post-war foreign economic policy.

Taylor, Tom (1817-80). British dramatist. Born at Sunderland, Oct. 19, 1817, he was educated at Glasgow university and Trinity College, Cambridge, of which he was made a fellow in 1840. Leaving Cambridge for London in 1844, he was



Tom Taylor

professor of English literature at London university until 1846, when he was called to the bar, but in 1850 he gave up the law for a government post, eventually becoming secretary of the sanitary dept. of the local government board. His leisure, meantime, had been devoted to literature and journalism. He contributed to Punch, and in 1874 became its editor. His dramatic career, on which his fame chiefly rests, had begun in 1844 when four of his burlesques were produced. He wrote, adapted, or collaborated in about 100 plays, some of which have been frequently revived. His best known pieces are *Masks and Faces*, 1852, with Charles Reade; *Still Waters Run Deep*, 1855; *Our American Cousin*, 1858; *The Ticket-of-Leave Man*, 1863; and *Lady Clancarty*, 1874. Taylor died at Wandsworth, July 12, 1880.

Taylor, Zachary (1784-1850). American soldier and statesman. Born in Orange co., Virginia, Sept. 24, 1784, except for a few years he was engaged from 1808 to 1847 in active military service. His earliest campaigns were against the Indians—Tecumseh, Black Hawk, and the Seminoles—and his last against Mexico, in which with greatly inferior forces he won the decisive victory of Buena Vista, Feb. 22-23, 1847, over the Mexican president, Santa Anna. In 1848, Taylor was a successful Whig candidate for the presidency. During his brief term, questions connected with slavery, and the disturbed condition of the country generally, prevented much attention being given to domestic reforms. Taylor died at Washington, July 9, 1850.

Taylor Institution. Establishment for the study of medieval and modern European languages, at the university of Oxford. It was founded and endowed in accordance with the will of Sir Robert Taylor (1714-88), architect, and is housed in S. Giles's, in the E. wing of a handsome building in the Ionic style, built 1845-48 after a design by C. R. Cockerell. The rest of the building, facing Beaumont Street, is occupied by the Ashmolean Museum (*q.v.*). The institution contains a library and lecture rooms, and is controlled by a board of curators, who administer endowments for lectures and scholarships.

Tayport or Ferryport-on-Craig. Town of Fife, Scotland. Situated on the S. side of the Firth of Tay on the rly. 3½ m. E. by S. of Dundee and opposite Broughty Ferry, it has a good harbour, and linen and jute factories, and engine works. Pop. 3,500.

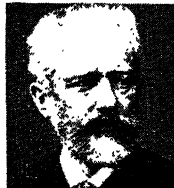
Taz. Name of a river and bay in E. Siberia. The river rises in two small lakes and, taking a generally N.W. direction, falls into the bay of the same name, which communicates with the Gulf of Obi. The Taz river is frozen from Nov. until June.

Tbilisi. Ninth city of the U.S.S.R., capital of Georgia S.S.R. and of Transcaucasia. It is situated on the Kura, 170 m. E. of Batumi, and has a long history, dating back to the 5th century, when King Vakhtang discovered hot springs here. In 455 it became the capital of the old kingdom of Georgia; it was taken by Russia in 1799. During the First Great War Tiflis, as it was then called, was the main object of the Turks in their Caucasian campaign. For long a centre of fine art manufacture, ranging from carpets to goldsmiths' work, it was modernised under the Soviet régime and became one of the greatest industrial cities of the U.S.S.R. A large hydro-electric plant draws power from the fast flowing rivers of the Caucasus. Here is a university and the Georgian academy of sciences; also the h.q. of the army of the Caucasus. It is linked by rly. with Tabriz, Persia, and by air with Moscow. Pop. 519,175.

Tchaikovsky, Piotr Il'yich (1840-93). Russian composer. He was born at Votkinsk, May 7, 1840, and after studying jurisprudence, entered St. Petersburg conservatoire, where he was persuaded by Rubinstein to adopt music as his profession. Ap-

pointed professor of harmony at Moscow conservatoire, 1866, he stayed until 1877. During these years he wrote his first opera, *Vojevodá*, 1869, which proved a failure, as did *Undine*, 1876; his symphonic poem, *Romeo and Juliet*, was derided in Vienna, and only with the success of his best-known opera, *Eugene Onegin*, 1879, did he attain general recognition. To this period belong the first three symphonies, piano concerto in B flat minor, *Swan Lake* ballet, and *Francesca da Rimini*. He made a disastrous marriage in 1877, but at the same time gained a patroness, Nadezhda von Meck, who, though she never met him, made the composer an ample allowance. Then came mature works despite lack of appreciation. The 4th and 5th symphonies reflected the melancholy and morbid introspection which had always characterised Tchaikovsky's disposition. Later works included the operas, *Queen of Spades*, and *Mazeppa*; the Mozartiana suite, *Sleeping Beauty* ballet, and *Casse-Noisette* suite. At a performance of the revised version of his opera *Vakoula* the Smith, entitled *Oxana's Caprice*, 1887, he made his début as a conductor, visiting European capitals and the U.S.A. In 1893 he poured into his 6th symphony (the *Pathetic*) what he regarded as his supreme emotional expression. Within 10 days of its first performance he died of cholera, Nov. 6, 1893.

Tchaikovsky's music attained universal popularity within a few years because of his capacity to express emotion in well-defined light and shade. In his big works he displayed a breadth and mastery of orchestration attained by few contemporaries. Of his symphonies the 5th and 6th are the most spectacular, and, with the first piano concerto, the most frequently heard works. His supreme artistic achievement is perhaps ballet music, which has a high power of evocation and theatrical lyricism. The 5th symphony was adapted by Leonid Massine as a ballet (*Les Présages*), 1933; and *Francesca da Rimini* and the overture *Hamlet* were also set. Few of his operas are performed outside Russia, where



P. I. Tchaikovsky, Russian composer



Tea. Natives of Ceylon preparing the leaves for export. 1. Picking the leaves. The labourers' living quarters built of concrete can be seen in the background. 2. Machines for rolling and bruising the dried leaves. 3. Drying leaves by spreading them on hessian trays called tats. 4. Sifting and grading the tea. 5. Expert checkers removing coarse parts which have escaped the grading process

Eugene Onegin is regarded as his masterpiece. His work is plainly unequal if one compares the noisy 1812 overture with the serene for strings, Italian capriccio, or piano trio. Many of his more than 100 songs are deservedly popular, and pieces such as *Chanson Triste*, and *Andante Cantabile* (from the serenade) are constantly performed. His *Life and Letters*, by his brother Modeste, was trans. by R. Newmarch, 1906; *Consult also* *Life*, G. Abraham, 1944.

Tchatyr Dagh (Tent Mountain, ancient *Trapezus*). Mt. of S. Russia. It is situated on the S.E. coast of the Crimea, 20 m. S.E. of Simferopol, and is 5,000 ft. high.

Tchekhov, ANTON. The career of this Russian writer is given under the spelling of Chekhov.

Tchernia, CERNIA, OR CRNA. River of Yugoslavia. It rises among the heights N.E. of Lake Ochrida, flows S.E., makes a great bend round the Selecka Planina, and continues N.E. to join the Vardar a few miles above Negotin. It figured prominently in the First Great War.

Tchernigov. This Russian town is described under its alternative spelling of Chernigov.

Tea. Term applied specifically to the leaves of the tea-plant and to the beverage infused from them. It is also applied to similar decoctions used either medicinally or as beverages, e.g. beef tea, camomile tea, sage tea, cowslip tea, etc. The Chinese name is *cha*.

The tea-plant is an evergreen tree belonging to the genus *Thea*, of which the *camellia* is regarded as a sub-genus, and to the family Theaceae. The leaf is strongly veined, with saw-like edges; the flower, usually white, often stalkless, and delicately fragrant; and the fruit has three spherical seeds. Opinions differ as to its original home. In India, Ceylon, and Pakistan, Assam Indigenous, China, and hybrid plants are used.

The Chinese may have used tea medicinally as early as the 3rd or 4th century A.D., but apparently not as a beverage until the 6th century. By the 9th century, when it was introduced into Japan, tea had become the staple Chinese drink. Christopher Borough, who accompanied a trading expedition into Persia in 1579, has been said to have introduced tea into England. It had become a popular beverage by about 1660. Early in the 19th century China tea-seed was experimentally planted in India, and,

after 1834, when the East India company's monopoly ceased and tea was proved through the pioneer researches of the brothers Bruce to grow wild in Assam, India began to cultivate tea.

The growth of the tea industry in Ceylon originated in the failure of the coffee crop in the last quarter of the 19th century. The tea-plant was introduced into Java in 1826 by the German scientist Philipp Franz von Siebold. Tea-growing has spread to British Africa—Kenya, Tanganyika, Uganda, and Nyasaland. Much tea is also grown by Russia, mainly in the Caucasus.

For tea-planting, a hot, moist climate, light friable soil, and good drainage are desirable. The seeds are either first kept in nurseries from six months to a year or more, or planted out direct—"at stake"—in the fields. The plants come to maturity in three years, and require very careful pruning. Tea is made only from the delicate top shoots, which are nipped off with the hand by women and children.

In the factory the pluckings are withered, i.e. exposed to the sun or hot air until soft and flaccid. After rolling, the leaves are allowed to ferment, or rather oxidise, in a cool, moist room. They are quickly

re-rolled and at once fired to extract moisture and prevent further fermentation, then sifted into grades, again fired, and finally packed. The factory processes are mostly carried out by machinery. These methods apply to a typical Indian or Ceylon black-tea concern. In China tea is grown chiefly by peasant proprietors on small plots, and is made by hand.

Green tea is unfermented and possesses more stimulating properties than black. In moderation tea soothes the nerves; excessive tea-drinking, especially if the tea be kept long standing or simmering, produces nervous excitation, insomnia, indigestion, and other evils. The main growing countries for green tea are China and Japan, but India and Ceylon produce some green tea. The principal names of green teas are, in order of quality, Gunpowder, a small closely rolled leaf; Imperial, closely rolled but bold; Hyson, a straight twisted leaf; Young Hyson, similar but much smaller leaf; and Hyson Skin and Twankay—from the river Tun-kei, in eastern Ngan-hui—often imperfectly rolled. The chief grades of Indian and Ceylon teas are of two kinds, broken and leaf, the former including fannings and dust. The customary leaf-grades are Orange Pekoe, Pekoe, and Pekoe Sou-chong.

In China the provinces watered by the Yang-tse are the principal source of the Moning or black-leaf Congous, and of fine green teas. The finest Fu-kien teas are grown on the Wu-i hills.

From a dialect form of Wu-i comes the well-known name Bohea, early used in England for fine tea generally, and later as a trade term for a low-quality tea. Fu-kien produces the "fancy" teas, e.g. Kokew Oolong, a species of green; and Flowery Pekoe, Foochow Scented Orange Pekoe, and Foochow Scented Caper, all scented with petals of jasmine or other sweet-smelling flowers. The term Pekoe means "white down," and denotes the delicate tip of the young tea-shoot.

Formosa produces chiefly Formosa Oolong, a species of green tea with a yellowish leaf, favoured by Americans. Akin to Oolong is Pouchong, "fold-sort," put up in little silk-paper packets, the exquisite packing of which remains a mystery to Europeans. Japan grows mostly green, and exports it direct to the U.S.A.

The principal tea-districts of India are Assam, Darjeeling,

Cachar, Dooars, Chota Nagpur, Kangra Valley, Dehra Dun, Kumaon, Travancore, and the Nilgiri Hills. The principal tea-growing area in Pakistan is Sylhet.

Tea for export is packed in aluminium-lined, air-tight cases, Indian and Ceylon mostly in chests containing approximately 100 lb., or in half-chests, containing about 60 lb., according to the wood available. China tea is packed in chests of about 84 lb., in half-chests of about 50 lb., and in caddies, sometimes gaily coloured, of 20 lb.

As a single tea rarely possesses rich colour, strength, and delicate flavour combined, the custom arose of blending together different teas. The average consumption of tea per head in Great Britain and Ireland just before the Second Great War was about 9½ lb. a year. In 1940 it was less than 1½ lb. per head.

Bibliography. Tea from Grower to Consumer, A. Ibbetson, 1930; The Culture and Marketing of Tea, C. R. Hailer, 1933; To Think of Tea, A. Repplier, 1933; All About Tea, W. Ukers, 1935; Tea: Its Production and Marketing, R. D. Morrison, 1946.

Teaching (A.S. *taecan*, to show). Word used in two senses: first, the body of evidence or instruction, the substance of what is shown or taught (e.g. the teaching of the Church, the teaching of the materialists); secondly, the act of instructing and the theory underlying it. Many wild and domestic animals appear to undertake some teaching of their young. Among human beings such teaching has been the necessary condition for the survival of the race and the transmission of domestic arts and crafts and of traditions. In the past craftsmen undertook the teaching of their "mysteries" to apprentices, and much ritual has been associated with the initiation into and the emergence from apprenticeship. Teaching, like other activities, tended to become a specialised occupation; full-time teachers date at least from ancient Greece, particularly in the arts and sciences—languages, mathematics, rhetoric, etc. Such teaching in medieval times, principally in the hands of the Church, led to the establishment of schools; but the teaching of trades and of domestic crafts was still carried on in the workshop and the home.

During the 19th century teaching in the U.K. emerged as a secular full-time occupation, and colleges were established to train

men and women in the art of teaching, though it remained possible for persons without such theoretical and practical training in teaching to become teachers. Specialisation increased in teaching as in other occupations until many teachers instruct in only one subject, sometimes one section of a subject. Broadcasting and films and other "visual aids" have affected the work of the teacher.

Much teaching of factory processes is organized within the works by employers, sometimes in close cooperation with local schools and colleges. Special methods have been evolved for teaching the blind, the dumb, and subnormal children in Special Schools (*q.v.*).

Teaching by correspondence developed enormously during the 20th cent., principally as a commercial enterprise, but in sparsely populated territories, e.g., parts of Canada, under official auspices. See Froebel; Kindergarten; Montessori; Pestalozzi; University.

Tea Duty. Tax imposed upon imported tea. In Great Britain it was levied in 1660 as a luxury tax, at the rate of 1s. 6d. a gallon of liquid tea, until 1680 when it became 5s. a lb. of tea. During the 18th and 19th centuries the tax was retained at rates varying from 100 p.c. ad valorem to a few pence a pound. During the 20th century tea came to be regarded as a household necessity, and the tea duty was often attacked as a tax on the poor. In 1929 the existing duty of 4d. a lb. on foreign and of 3½d. a lb. on Empire tea was repealed. It was, however, reintroduced at a reduced rate in 1932; and the duty was retained during the Second Great War although its yield was virtually offset by subsidising the price of tea: thus, in 1947 the duty of 6d. a lb. yielded £9.5 million, but the tea subsidy cost £9 million. In Oct., 1948, it was estimated that because of the great rise in the market price of tea the tea subsidy during that fiscal year would cost £17.1 million, nearly twice the amount of the estimated yield from the duty. The attempt of the British govt. in 1767 to enforce the payment of tea duty by the American colonists was one of the immediate causes of the War of American Independence.

Teak (*Tectona grandis*). Large timber tree of the family Verbenaceae, native of Indo-Malaya. It attains a height of 100–150 ft., and has opposite, oval leaves. The panicles of white flowers are



Teak. Foliage and fruit of this Malayan tree; inset, flowers

succeeded by woolly fruits enclosed in the persistent bladder-like calyx. The timber is exceedingly valuable in shipbuilding. It is largely cultivated in India, Burma, and Java, for its timber. Before cutting the growing tree is "girdled," a ring of bark being cut from the base of the trunk, which kills the tree and denudes it of sap. It is then left standing for two years. African teak, a hard and heavy wood, is the product of *Oldfieldia Africana*, a tree of the spurge family (Euphorbiaceae) and a native of W. Africa.

Teal (*Anas crecca*). A small species of duck. It is a native of Europe (including Britain) and Asia. The drake is marked by a jagged white line with black below it along the wing, a buff triangular patch below the tail, and the red-brown head with a buff-edged, curved green band on each side, in which the eye is included. The duck has a more uniform dress of buff dappled with brown; but for its small size it might be confused with the female mallard. It is in general a bird of inland lakes and pools, though in winter large numbers may be seen at the mouths of rivers. It feeds on minute aquatic animals and on water weeds. The nest, of the usual duck type, is built in marshy ground, or among heath plants on the moorland, and contains from 8 to 12 cream-tinted eggs.



Teal. Drake of the small European species of wild duck
W. S. Berridge, F.Z.S.

Te Anau. Lake of New Zealand, in Otago, South Island. The largest and in parts the most picturesque of the lakes in the S. Alps, it stretches for 40 m. almost N. and S., with fjord-like arms between forest-clad and snow-capped mts.

Teano (anc. *Teanum Sidicinum*). City of S. Italy, in the prov. of Naples. Situated 14 m. by rly. N.W. of Capua, at the foot of an extinct volcano Rocca Monfina, 3,297 ft., it contained a 14th century castle and a 16th century cathedral which was almost completely destroyed during the Second Great War. Teano was held by the Hermann Goering div. against the Allied 5th army, British troops of which captured it Oct. 31, 1943. Ruins of a Roman theatre, baths, and houses attested its ancient importance.

Tear Bottle OR **LACHRYMATORY.** Term applied to small, narrow-necked bottles or phials found in ancient tombs, and supposed to have contained tears shed for the dead person. The custom is possibly referred to in Ps. 56, v. 8. Some authorities are of opinion that the bottles contained perfume.



Tear Bottle from an Etruscan tomb, length 6 ins.

Tear Gas. Lachrymatory irritant. It causes copious watering of the eyes and nose, and was first used as a military weapon by the Germans in the First Great War, later being adopted by the other belligerents. It was most commonly distributed by shells, the usual mixture consisting of ethyl-bromo-acetate, chloro-acetone, benzyl bromide, benzyl iodide, and iodo. Although tear gas in warfare is prohibited by the Geneva gas protocol (1925) to The Hague convention of 1907, there is no restriction upon its use by civil police in the suppression of riots. Police usually distribute it in grenades which weigh 1 lb. and are thrown by hand. See Chemical Warfare.

Tearle, GODFREY (b. 1884). Anglo-American actor. He was born in New York, Oct. 12, 1884, and educated at Carlisle grammar

school, first appearing as a boy in Richard III at Burnley, 1893. Adopting the stage as a career, 1899, he joined the co. of his father, Osmond Tearle. He formed his own co., 1904-06, and appeared on the London stage at His Majesty's in Attila, 1907. A fine presence suited him to virile parts, and he became a leading actor in London and New York in Shakespeare and in contemporary pieces, his most memorable performances including those in Carnival, 1919; The Garden of Allah, 1920; The Faithful Heart, 1922; Living Dangerously, 1934; The Flashing Stream, 1938; The Light of Heart, 1940. He played in a screen version of Romeo and Juliet as early as 1906; a later film was One of Our Aircraft Is Missing. Tearle in 1932 was elected first president of Equity (q.v.).

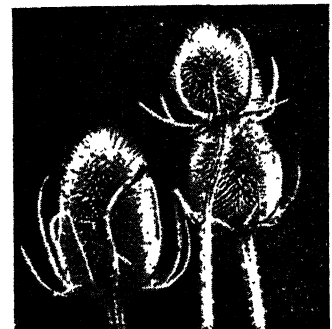


Godfrey Tearle, Anglo-American actor

Tea Rose. Name given to a class of perpetual or autumnal roses. Mostly hybrids of *Rosa indica*, they include many of the most popular varieties, e.g. Maréchal Niel and Gloire de Dijon. The name is derived from the scent. See Roses col. plate.

Teasel OR **TEAZEL** (*Dipsacus sylvestris*). Tall biennial herb, one of the family Dipsacaceae. It is a native of Europe, W. Asia, and the Canaries. In the first year it forms a large spreading rosette of oblong, lance-shaped leaves with prickly midribs. In the second it develops a tall stiff stem with prickly ribs, and large leaves in pairs, the lower ones with their bases joined so that they hold a large quantity of water. The small, tubular, purplish flowers are gathered into

heads after the flowers have died, showing the stiff bracts



Teasel. Heads after the flowers have died, showing the stiff bracts

an oblong head. In the cultivated form known as the fuller's teasel (*D. fullonum*) these bracts are used for producing the nap on cloth, or teasing it, whence the name.

Tea-tree (*Leptospermum lanigerum*). Small tree of the family Myrtaceae, native of Australasia. It has alternate, oblong, leathery, and downy leaves, and its flowers are white with a woolly calyx. The name is due to the early English settlers using the leaves as a substitute for tea. In other parts of the world other plants bear this popular name; in England it is applied to *Lycium chinense*.

Teazle, SIR PETER. Character in Sheridan's play, *The School for Scandal* (*q.v.*). He is an elderly man with a young, pleasure-loving, extravagant wife.

Tebessa (anc. Theveste). Town of Algeria. It lies at an alt. of 3,500 ft. about 100 m. S.S.E. of Bone, with which it is connected by rly. Here are extensive Roman ruins, including a triumphal arch, a temple of Minerva converted into a Christian church, and a circus, built to seat 6,000-7,000 spectators. The country round is fertile, well wooded, and well watered. The modern town, est. pop. 8,000, is in an important strategic position. It is largely a creation of the French who occupied it in 1851. During the Second Great War Allied forces which landed in N.W. Africa in Nov., 1942, and entered this part of Tunisia without opposition, turned Tebessa into a supply base. During the battle of the Kasserine pass (see North Africa Campaigns), Feb., 1943, the Germans attempted to break through to Tebessa, but were held by U.S. troops.

Tebeth. Tenth month of the Jewish ecclesiastical and fourth of the civil year. Borrowed from the Assyrian calendar and meaning the muddy month, it corresponds approx. to Feb.-March.

Techetium. Chemical element, symbol Tc, at. no. 43; formerly known as masurium. It is very rare, and little is known of its properties.

Technical Education. Term applied to the provision for teaching arts, handicrafts, trades, industrial and commercial processes, principles, and organisation. The distinction between technical and non-technical education lying as much in aim as in content, educational curricula can rarely be classified rigidly into technical and non-technical, vocational and non-vocational. Certain educational provision, however, is made

primarily to meet the needs of those within or proposing to enter certain occupations, or to satisfy the declared requirements of particular industries and trades. Such provision exists to some extent in the U.K. in all types of educational institution, but in certain schools and colleges the relationship to industry and trade is more marked and obvious.

Decline of Apprenticeship

Before the industrial revolution craft apprenticeship, standardised in the Elizabethan Statute of Artificers (1562), was the principal means of technical education. The development of factories in the 18th and 19th centuries brought, on the one hand, the decay of craft apprenticeship, and on the other hand, the need for workers with a knowledge of general principles rather than manual skill. Appreciation of this need led to the establishment in 1823-24 of several mechanics' institutes to give the necessary instruction in mathematics, applied science, etc. By 1850 there were more than 600 such institutes in England and Wales; many of them still exist as technical colleges.

The great exhibition of 1851 drew public attention to the lack of facilities for technical education. In 1852 the dept. of practical art was organized under the board of trade, and four years later this was made a branch of the newly established Education dept., and became the dept. of science and art. In 1859 it established two systems of examinations in science, one for teachers, the other for students. The Royal Society of Arts, itself an offshoot of the great exhibition, also instituted examinations in various branches of applied art, extending them in 1873 to technological subjects.

The relative failure of Great Britain at the Paris exhibitions of 1867 and 1878 emphasised the need for greater provision for specialised technical education in that country and led to the establishment of the City and Guilds of London institute in 1878 by the corporation of London and certain, of the livery companies, and the appointment, 1881, of a royal commission to inquire into technical education in the U.K. and abroad.

The institute, to which the R.S.A. transferred its technological examinations in 1879, has not only maintained colleges of technology and art, but also, through its dept. of technology, provided a flexible link by which advisory committees in an immense

range of industries and trades could influence the development of the technological instruction, training, and certification of their technicians and technologists.

The reports of the royal commission emphasised the need for a good secondary education as the best preparation for technological study, and led, through the passing of the Local Government Act, 1889, the Technical Instruction Act, 1889, and the Local Taxation and Customs and Excise Act, 1890, to the establishment of secondary and technical schools and colleges maintained by counties and county boroughs.

The board of education was established in 1899 to combine various authorities; and following the Education Act of 1902, numerous new secondary and technical schools were established; but the regulations for secondary schools, 1904-05, introduced a division between secondary and technical education, and fostered the tendency to adhere to the traditional grammar school curriculum. The official attitude was modified by the circular on the curricula of secondary schools, 1913; and gradually vocational specialisation became the rule rather than the exception in the sixth forms of secondary schools.

Trade Schools and Others

At the beginning of the 20th cent. a few full-time day trade schools were established, particularly in the London area; e.g. that for furniture and cabinet-making at the Shoreditch technical institute in 1901. Such schools were a substitute for apprenticeship. Their success led to the institution in 1913 of junior technical schools of two kinds: (a) trade schools, a substitute for apprenticeship; and (b) pre-apprenticeship schools, which receive pupils between the ages of 13 and 14. Junior technical schools combine general secondary education with specialised work.

Since 1902 education authorities have been empowered to pay for technical education out of the rates, and most large urban centres have one or more maintained technical colleges, which aim largely to apply science and art to the needs of industry and trade in the neighbourhood.

Quickening of the interest and cooperation of industrialists and business men in the technical training of their employees has been indicated by (1) the appointment by professional, industrial, and commercial associations of

education committees; (2) the provision of funds to endow or to equip technical colleges; (3) the recognition of the technical competence of employees through promotion, money awards, etc., on the passing of examinations or the completion of educational courses sponsored by the industry.

National certificates in building, chemistry, mechanical and electrical engineering, naval architecture, textiles, commerce, and other subjects are awarded to part-time students who have satisfactorily completed a course of study, usually extending over three years of evening attendance, and passed an examination in which the college, the ministry of Education, and the representative technical body (e.g. the institute of mechanical engineers, the institute of builders) cooperate. Higher national certificates involve a further two years of part-time study. National diplomas are awarded on the satisfactory completion of full-time courses.

Most vocational study is undertaken by those who are already in employment, and takes the form of attendance at evening classes. Some employers, however, permit their juniors to stop work earlier in order to attend classes; and in some industries, e.g. engineering and printing, apprentices are usually able to attend day classes on one or more days a week without loss of wages.

Under the Education Act, 1944, it became the duty of education authorities to provide adequate facilities for further education, including technical education and training, and regional advisory councils were set up to cooperate with local industries in the setting up of regional colleges of further education, and other requisite institutions. National colleges, the responsibility of the ministry and of the industry they serve, were contemplated in certain industries of importance in which the workers are comparatively few, e.g. watch and clock industry.

Valuable educational work is also initiated and financed by individual companies, usually on their own premises, much of it of an advanced character and combined with research work. It has been an important factor in the development of the technology of aeronautical engineering, electronics, and plastics, metallurgy, and gas production and supply. *Consult* Education Act, 1944; Higher Technological Education (Percy Report), H.M.S.O., 1945.

Teck. Castle of Württemberg, Germany. It stood near Kirchheim, and was destroyed in 1575. It gave its name to a duchy dating from the 12th century. The family holding it became extinct in 1439, but from 1495 to 1806 the title was held by the dukes of Württemberg. In 1863 Alexander (1804-85), a member of the royal family of Württemberg, having made amorganatic marriage, was created prince of Teck.

Alexander's son, Francis (1837-1900), made duke of Teck in 1871, had married, in 1866, Mary Adelaide, daughter of the duke of Cambridge and cousin of Queen Victoria. They made their home at White Lodge, Richmond. Their sons were Adolphus (1868-1927),



Duke and Duchess of Teck, parents of Queen Mary

who married Margaret, daughter of the duke of Westminster, Francis (1870-1910), and Alexander (b. 1874), who married Alice, daughter of the duke and duchess of Albany. The daughter, Mary, became the wife of George V. The duchess of Teck died Oct. 27, 1897. In 1917 the family changed its name to Cambridge. Adolphus, who had succeeded his father as duke, Jan. 20, 1900, was made a British peer as marquess of Cambridge, and Alexander was made earl of Athlone. *See* Mary, Queen.

Tecoma. Genus of evergreen trees and climbing shrubs of the family Bignoniaceae. They differ from the bignonias chiefly in their lack of tendrils, and there are about 24 known species, natives of sub-tropical regions. The leaves are opposite, and the tubular, red, yellow, or orange flowers grow in racemes or terminal panicles. *T. radicans*, the trumpet flower, and *T. grandiflora* grow in the open against a sunny wall, in S. England, but the other species, of which the best known are *T. australis*, the wonga-wonga vine, and *T. capensis*, require hot-house treatment. *See* Bignonia; Trumpet Flower.

Tectonics (Gr. *tektōn*, carpenter). Art by which implements, buildings, etc., are constructed, taking into consideration their artistic design as well as their use.

In geology, the word tectonic is used with reference to the structure and external form of rocks which have resulted from deformations of the earth's crust. Thus mountains thrown up as a result of earth movements are called tectonic mountains.

Tecumseh (1768-1813). American Indian chief, sometimes called Tecumthe. Born in Ohio, near the site of the present Springfield, a chief of the Shawnees, he took part in 1804 in a plan for uniting the Indians to extirpate the whites, and in 1808, on the Tippecanoe Creek, Indiana, he established a village which was intended to be a return to the simple life of the Indians. In 1811 he led a rising, and on its suppression he passed over into the British service as brigadier-general, being given command of the Indians in the war of 1812. He took part in the capture of Detroit, and fell in action at the battle of the Thames, in Canada, Oct. 5, 1813. *Consult* Life of Tecumseh. B. Drake, 1841.

Tedder, ARTHUR WILLIAM TEDDER, BARON (b. 1890). British air officer. Educated at Whitgift school and Magdalene College, Cambridge, he entered the colonial service. He served with distinction in the R.F.C. in France and Egypt during the First Great War. He commanded a R.A.F. flying training school, 1924-26. Director of



Lord Tedder, British air officer

training at the Air ministry, 1934-36, he was in charge of research and development at the outbreak of the Second Great War, when he was chiefly responsible for introducing new types of aircraft and equipment. In 1940-41 he was in the Middle East. As air officer c.-in-c., R.A.F., Middle East, 1941-43, he organized the powerful air offensive which aided the 8th army's advance across N. Africa. Tedder was deputy supreme commander, A.E.F., 1943-45. He signed on behalf of the A.E.F. the confirmation in Berlin of Germany's surrender, May 8, 1945; in Sept. he was promoted marshal



Tecumseh, American Indian chief

of the R.A.F. Chief of air staff 1946-49, he became in 1950 British representative on the N. Atlantic treaty military committee. Knighted 1942, and given a barony 1946, he was elected chancellor of Cambridge univ. 1950.



Teddington, Middlesex. Lock and rollers on the Thames, looking downstream
"The Times"

Teddington. Part of the borough of Twickenham, Middlesex, England. It is 13½ m. by rly. S.W. of Waterloo, and 19½ m. from London Bridge by the Thames, which is tidal as far as Teddington Lock. The manor once belonged to Westminster Abbey. Of the church of S. Mary, dating from the 16th cent. the N. aisle and tower were built by Stephen Hales (d. 1761), who was rector for 51 years and was buried here, as was John Walter, founder of The Times. Robert Dudley, earl of Leicester, and William Penn were residents of Teddington, which is a favourite angling resort. The National Physical Laboratory was established here in 1902. Pop. 23,362.

Teddy Bear. Child's toy, used as a variety of doll. Modelled on the koala, it is of soft material, covered with golden brown fur, has movable head, arms, and legs, and can sometimes be made to "growl." First introduced in the U.S.A. about 1909, it was called Teddy in reference to the much publicised big-game hunting expedition undertaken in that year by the former president Theodore Roosevelt, and has been a nursery favourite on both sides of the Atlantic ever since.

Te Deum Laudamus (Latin, we praise thee God). Chief canticle of the Christian Church. In the Church of England it is sung after the first lesson at morning prayer, though in Lent the Benedictus is an alternative. In the Roman service it appears in matins and on special thanksgiving occasions. Tradition ascribed the origin of the canticle to S. Ambrose or S. Augustine or both, but its author was Niceta, bishop of Remesiana. Verses 7-9 resemble closely a passage in S. Cyprian (3rd cent.), and

some of the expressions those of the morning hymn (4th or 5th cent.) of the Eastern Church. Caesarius, bishop of Arles in the 5th cent., is the first to refer directly to the hymn. It is "the great hymn of triumphant praise in the Western Church, as the Gloria in Excelsis is in the Eastern."

Tee. Small cone of sand, rubber, or other material for driving off at the start of each hole in golf (q.v.). The most general form of tee is a small mound of sand upon the top of which the ball is placed. Of manufactured tees, the most popular is a small peg that is pointed at one end and has a shallow cup on the other. This is pushed into the

ground and the ball placed in the cup. The flight of the ball may be varied according to the height of the tee. The term tee is also used for the aiming mark in curling (q.v.).

Tees. River of England. It rises in Cross-fell, Cumberland, and forms first the boundary between Durham and Westmorland, and then that between Durham and Yorkshire. Teesdale, the valley through which the upper part of the river flows, contains the waterfall High Force, and other beauty spots.

A few miles from its mouth the river flows through a busy industrial area, passing Darlington, Stockton, and Middlesbrough, where the estuary begins. Its tributaries are the Lune, Balder, and other small streams, and its length is about 80 m. It is navigable to Stockton.



Tee. Manufactured variety

TEETH: THEIR GROWTH & VARIETIES

J. Sim Wallace, M.D., D.Sc., Author of *The Teeth and Health*

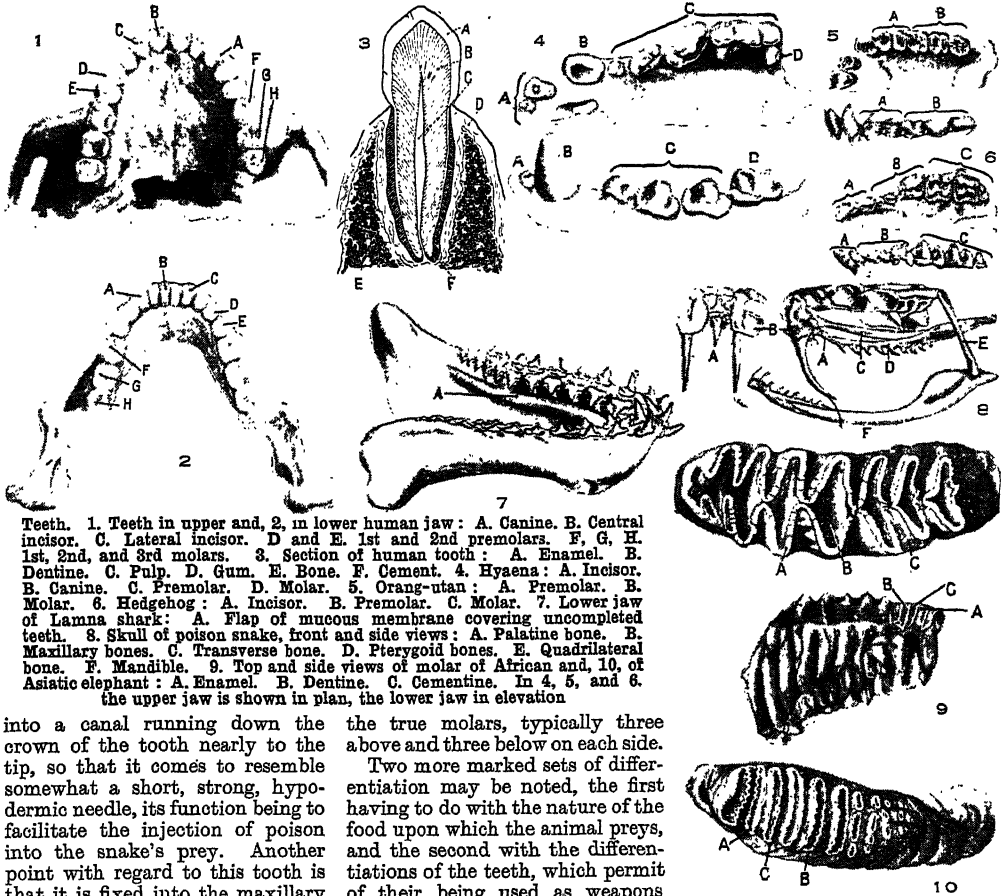
See the articles *Dentistry*; *Dentition*; *Pyorrhoea*; *Rodent*; those on *Man* and various animals, e.g. *Lion*, *Tiger*; also *Anatomy*.

The teeth are the bone-like structures in the mouth, or at the commencement of the alimentary canal. They are developed from the derma or skin, although the underlying tissue takes part in their formation. A tooth usually consists of a crown projecting through the gum, and a root embedded in the underlying tissue. The crown is typically covered with enamel, and the root with a bone-like substance called cementum. The neck of the tooth is the part between the crown and the root where the gum surrounds it.

The enamel is the hardest tissue in the body. It is white or bluish-white and slightly translucent, having a polished appearance on the surface. It consists almost entirely of inorganic salts of calcium and magnesium, together with a little water. Underneath the enamel is the bone of the tooth or dentine, which as a rule forms its greater part. This is a hard, yellowish bone-like substance, and in one form, ivory, is well known. Unlike the enamel, it consists in organic matter, about 26 p.c. This organic matter is a kind of gelatinous or cartilaginous substance. There is about 8 p.c. of water; the remaining 66 p.c. is composed of salts of calcium and magnesium. There is an elasticity in the dentine, and the cracks seen in worn enamel are not found in dentine.

The teeth of fishes are not confined to the jaws, but frequently cover all the bones in the mouth and even gullet (pharynx), so as to make it difficult, if not impossible, for any foodstuff taken into the mouth to get out of it except by passing down the alimentary canal. Not only are the teeth of fishes often very numerous, but there may be a continuous succession of teeth, so that old and worn teeth are replaced by new and sharp ones. The succession of the teeth may be from below or it may come about from a gradual shifting of the integument carrying the teeth, so that the new and sharp teeth occupy the most suitable ridges on the bones round the mouth, until they become blunted and superseded by new teeth. This is the common mode of succession in the shark. Another interesting form of tooth to be found among fishes is the hinged tooth, found in the cod and hake. The tooth can become more or less recumbent when food is passing down the throat, but is erect and antagonistic to food passing in the opposite direction.

The most highly differentiated tooth in reptiles is to be found in the poisonous snakes. In these, the poison fang is frequently grooved, and in the viper and rattlesnake the groove becomes so accentuated that it is converted



Teeth. 1. Teeth in upper and, 2, in lower human jaw: A. Canine. B. Central incisor. C. Lateral incisor. D and E. 1st and 2nd premolars. F, G, H. 1st, 2nd, and 3rd molars. 3. Section of human tooth: A. Enamel. B. Dentine. C. Pulp. D. Gum. E. Bone. F. Cement. 4. Hyena: A. Incisor. B. Canine. C. Premolar. D. Molar. 5. Orang-utan: A. Premolar. B. Molar. 6. Hedgehog: A. Incisor. B. Premolar. C. Molar. 7. Lower jaw of Lanna shark: A. Flap of mucous membrane covering uncompleted teeth. 8. Skull of poison snake, front and side views: A. Palatine bone. B. Maxillary bones. C. Transverse bone. D. Pterygoid bones. E. Quadrilateral bone. F. Mandible. 9. Top and side views of molar of African and, 10, of Asiatic elephant: A. Enamel. B. Dentine. C. Cementine. In 4, 5, and 6, the upper jaw is shown in plan, the lower jaw in elevation.

into a canal running down the crown of the tooth nearly to the tip, so that it comes to resemble somewhat a short, strong, hypodermic needle, its function being to facilitate the injection of poison into the snake's prey. Another point with regard to this tooth is that it is fixed into the maxillary bone, which is hinged so that when the snake strikes, the poison fang is erected before it is driven into the flesh of the victim.

The teeth of mammals are adapted to, and vary considerably according to, the uses to which they are put. In marsupials, varieties of dentition are to be met with, often resembling the dentition of the higher mammals. Thus there are a carnivorous, an insectivorous, and an herbivorous type. In higher mammals, as a rule, there are two sets of teeth—the milk dentition subserving the needs of the animal during its growth, and the permanent dentition from maturity onwards. The teeth are also differentiated according to their position in the mouth. At the front of the mouth there are incisors, three on each side, above and below. Then follow the canines, one above and one below, on each side. Next come the premolars, typically four above and four below on each side. All these teeth succeed the corresponding temporary teeth. Lastly there are

the true molars, typically three above and three below on each side.

Two more marked sets of differentiation may be noted, the first having to do with the nature of the food upon which the animal preys, and the second with the differentiations of the teeth, which permit of their being used as weapons of offence, more especially among the males. With regard to the first group, the most simple form of dentition is found among the piscivorous mammals, such as the dolphin, in which the teeth are all similar in shape, being of a conical form. This group differs from most of the higher animals in not having two sets of teeth. Insectivorous mammals are distinguished by having teeth with numerous sharp cusps. The carnivorous type have large recurved conical canines, and molars adapted for the slicing of flesh from bones.

Herbivorous animals have generally molars of a more or less complex character, which gradually become worn down on the crown, but this is compensated for by the more or less continuous growth of the tooth.

Rodents also have teeth of continuous growth. The omnivorous type does not show extreme variations from the generalised variations typical of mammals. Although monkeys and apes are generally looked on as fruit-eating animals,

their dentition does not differ essentially from the omnivorous type. A further form of specialisation common among some groups of the higher mammals is the development of one or more teeth in the front of the mouth in such a way that they may be used as weapons of combat. Thus, in the narwhal, one incisor tooth in the male is enormously developed, forming a straight tusk of great strength. In the elephant, two incisors form the tusks, which are used not only in combat.

One of the marked characteristics of human teeth is their similarity to those of the anthropoid apes. They are, however, placed somewhat differently. The incisor teeth of apes project obliquely forward: indeed, all the teeth are placed more forward with regard to the body of the jaw than in man. In man there is no interval between the upper canines and incisors, nor between the lower canines and the first premolar, as among apes.

The teeth of man are relatively somewhat smaller than those of

apes. The canines are not developed so as to project above the line of the other teeth, and the wisdom-tooth is frequently relatively small. Sometimes it is quite a dwarfed tooth, and is indeed occasionally absent. When its growth is stunted, it is not so liable to decay as when large, for the crevices in the stunted wisdom-tooth are relatively small.

Lack of oral hygiene is the main general cause of decaying teeth. Lack of function in mastication of such foods as tend to clean the teeth mechanically or otherwise, or the consumption of foods which baffle the beneficent action of the glands of oral hygiene (the salivary and mucous glands), may be regarded as the primary causes. Such lack of function tends to allow of the stagnation of food or secretions, thus giving a foothold to bacteria, which may be able in such circumstances to attack the tooth or surrounding gum.

Irregularities of the teeth may be prevented by methods of feeding which stimulate the functional activity of the jaws, teeth, and gums, and leave the mouth physiologically clean after every meal.

Artificial methods of preservation of the teeth follow the same principles, although they are not so efficacious. The tooth-brush usually fails to clean the crevices of or between the teeth effectually, so that it is desirable in addition to use a slightly acid and aromatic mouth-wash. The friction of the tooth-brush on the gum, when not excessive, also helps to keep it clean and healthy.

Teeth, ARTIFICIAL. Substitute for natural teeth in human beings. A variety of materials is used for taking accurate impressions or casts of the upper and lower jaw. These materials include plaster of Paris, which is introduced into the mouth in shallow metal containers called trays in a soft condition and allowed to harden in the mouth, after which it is removed. More liquid plaster is poured into the tray and allowed to harden. The tray is then removed, together with the first impression, and leaves an accurate cast or die of the mouth. Alternatively an impression may be taken with composition, which is introduced into the mouth in trays after having been softened in boiling water. Another material, zelex, is used with ordinary impression trays after having been mixed with equal quantities of water.

An accurate cast of the mouth being obtained, dentures are con-

structed in several stages. Blocks of wax are used to obtain the "biting" articulation of the patient. The artificial teeth are inserted in the wax; the whole is sunk into plaster of Paris; the wax is poured away, and the space it previously occupied filled in with the actual base material of the denture. Formerly this space was packed with rubber, which was vulcanised under pressure; later plastic materials came to be used for both plate and teeth.

Artificial teeth may replace all the patient's teeth or may be fitted around some of them (partial dentures). Dentures can also be made with 9 or 18 carat gold as a base. The plastic base is commonly called acrylic material; its advantages over vulcanite are that it is non-porous, very light, and made without colour or in colours that more nearly approximate to the natural colourings of the gums.

B. Murray-Davies

Teething. Process of cutting teeth by an infant. Rudiments of the teeth already exist in the jaw before birth. The process is inevitably disturbing and sometimes the gums become red and swollen and the child fretful and feverish. Small doses of "grey powder" may be helpful. The age at which teething occurs varies, and bears little relation to a child's health.

Teetotalism. Popular term for abstinence from alcoholic liquor. See Prohibition; Temperance.

Tegea. Town of Arcadia in ancient Greece, and capital of the surrounding dist. of Tegeatis. Considerable excavations have been made on the site of the temple of Athena, which was rebuilt under Scopas (c. 375 B.C.), and was the finest in the Peloponnese.

Tegern See. Village and lake of Germany, in Upper Bavaria. The village, 37 m. by rly. S. by E. of Munich, lies the E. lake shore and attracts tourists by its beautiful walks. The castle was once a Benedictine abbey, suppressed in 1803 after a life of nearly 11 centuries. The Grosse Parapluie (2,625 ft.) commands fine views.

Tegetmeier, WILLIAM BERNARD (1816-1912). British naturalist.



W. B. Tegetmeier,
British naturalist

The son of a medical practitioner, he was born at Colnbrook, Nov. 4, 1816. He was educated for the medical profession, but after a short

experience of a country practice, he settled in London, and turned to journalism, becoming natural history editor of *The Field*. His scientific interests led him to develop the use of homing pigeons in time of war, and to assist Darwin in his inquiries into variations in animals. One of the founders of the *Savage Club* (q.v.), Tegetmeier died Nov. 19, 1912.

Tegetthoff, WILHELM, BARON VON (1827-71). Austrian sailor. Born at Marburg, Styria, Dec. 23, 1827, he entered the navy, and in the Danish war of 1864 distinguished himself at the battle of Heligoland. In the Seven Weeks War he commanded the Adriatic fleet, and defeated the Italians under Persano, at the battle of Lissa (q.v.), July 20, 1866. From 1868 he was commander-in-chief of the Austrian navy until he died in Vienna, April 7, 1871.

Tegnér, ESALAS (1782-1846). Swedish poet and bishop. Born Nov. 13, 1782, son of the pastor of Kyrkerud, Värmland, he graduated in 1802 at Lund, where he was appointed lecturer, and in 1812 was professor of Greek at Stockholm. In 1824 he was made bishop of Vexjö, where he remained until his death, Nov. 2, 1846.



Esaias Tegnér,
Swedish poet

Tegnér began to write poetry at an early age. In 1808 his *Warsong of the Troops of Scania* was enthusiastically greeted by the nation. *Svea*, a patriotic poem which gained the grand prize of the Swedish academy, followed in 1811. His masterpiece, *Frithiof's Saga*, 1825 (Eng. trans. 1833), has been translated into many languages. *Pron. Teng-nare*.

Tegucigalpa. The capital of Honduras. It is situated on the Choluteca river at an alt. of 3,300 ft., and is connected by road and ferry service with its port of Amapala, 78 m. to the S., on the Gulf of Fonseca. There is an airport at Toncontin. The university has faculties of law, medicine, pharmacy, and engineering. There are a cathedral, and Aztec remains. Mines of gold, silver, and marble are worked near by. Pop. 55,715.

Teheran or **TEHRAN.** Capital of Persia and of a prov. of the same name. It stands in the midst of a fertile plain, about 70 m. S. of the Caspian, and is the centre of a net-

work of roads and rlys. With an area of $7\frac{1}{2}$ m., it is girt about with bastioned walls, pierced by 12 gates, and contains numerous mosques and the Ark or citadel, within which is the royal palace. It has a carpet-making industry, and factories turning out silk, tapestry, glass, chemicals, arms, ammunition, tobacco, and matches. There are a university and an appeal court. Teheran is the residence of the shah and seat of the government. Pop. 699,110.

Teheran replaced Ispahan as the Persian capital late in the 18th century. During the revolution of 1909, the shah took refuge in the Russian legation here, and later abdicated. In 1910 Teheran was the scene of another rising.

During the Second Great War, when Persia (*q.v.*) became a centre of Nazi German intrigue, British troops from the S., Russians from the E. and W., entered Teheran Sept. 17, 1941, to enforce Allied demands for the surrender of Axis nationals; they withdrew Oct. 18. At Teheran Nov. 28-Dec. 1, 1943, Churchill, Roosevelt, and Stalin had their first meeting; they discussed and agreed on plans for 1944 in the war against Germany. Churchill, who celebrated his 69th birthday during this meeting, also handed to Stalin the sword of honour presented by George VI to the city of Stalingrad. See Stalingrad, Battle of.

Tehetmes. Variant spelling of Thothmes (*q.v.*), the name of several Egyptian kings.

Tehuantepec. Town of Mexico, in the state of Oaxaca. It stands on the isthmus and river of Tehuantepec, and is served by the rly. running from Coatzacoalcas, on the Gulf of Mexico, to Salina Cruz, on the Pacific. The inhabitants engage in cotton weaving. Pop. 12,300.

Tehuantepec, ISTHMUS OF. Narrowest part of Mexico. It extends 125 m. between the Gulf of Mexico and the Bay of Tehuantepec, an arm of the Pacific Ocean.

Tehuantepec Winds. Strong cold winds experienced on the Pacific side of Central America. The



Teheran, Persia. Rue Ferdusis, with modern shops

air over the mountains is cooled and carried by cyclonic aid to the coast.

Tehuelche (Araucanian, big-south-men). South American Indian tribe in Patagonia. From their cold-weather use of guanacostin foot-wrappings, Magellan's companions—perhaps appropriating a native name—called them Patagones (big-feet), although the feet are less than 11 ins. See Bororos.

Teifi. River of S. Wales. It rises near the border of Radnorshire and flows in general S.W., to reach Cardigan Bay after a course of about 50 m. For most of its course below Lampeter it forms the S. boundary of the co. with Carmarthenshire.

Teign. River of Devon, England. It rises on Dartmoor, under Liddaford Tor, drains the moor, and falls into the English Channel at Teignmouth. Its length is 30 m.

Teignmouth. Seaport, watering-place, and urban dist. of Devon, England. It stands on the S. coast at the mouth of the Teign, 15 m. by rly. S. of Exeter. The chief church is S. Michael's, rebuilt in the 19th century, but containing a little of the earlier Norman church. S. James's retains a Norman tower. Other buildings



Teignmouth arms

are the market hall, the Athenaeum, and a large convent. The harbour will take small vessels. China clay is exported, and coal imported. The town consists of two parts, known as King's or E. Teignmouth, and Bishop's or W. Teignmouth. At one time it was a centre of the salt industry. Pop. est. 10,000. Pron. Tinnmuth.

Teignmouth, JOHN SHORE, 1ST BARON (1751-1834). British statesman. Born Oct. 8, 1751, and educated at Harrow, he entered the service of the East India co. in 1769. Member of the supreme council in 1787, six years later he succeeded Marquess Cornwallis (*q.v.*) as governor-general, and was made a baron on retiring in 1798. He died Feb. 14, 1834.

The title is still held by his descendants. Henry Noel Shore, the 5th baron (1847-1926), served in the navy, and wrote books on travel and smuggling. His Smuggling Days and Smuggling Ways appeared in 1892. The 6th baron, Hugh Aglionby Shore (b. 1881), succeeded to the title in 1926.

Teind (Old Norse *tiund*). Word used in Scotland as the equivalent of tithes. Tithes were paid to the clergy from ancient days, and at the Reformation John Knox maintained that, after making some provision for the dispossessed clergy, the balance should be devoted to the support of the Protestant ministry, public education, and relief of the poor. This was only partly carried out, and the teinds are now held in part by the crown, universities, and other pious foundations, lay titulars, and landed proprietors. Provision



1st Baron Teignmouth, British statesman After G. Richmond



Teignmouth, Devon. The front, seen from the sea

for the valuation of teinds was made by the Church of Scotland, 1925. *See Tithe.*

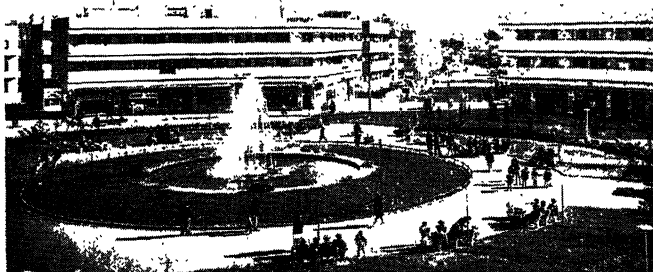
Teisserenc de Bort, LÉON PHILIPPE (1855-1913). French meteorologist. He was born in Paris Nov. 5, 1855, and from 1892 to 1896 was chief meteorologist to the central meteorological bureau in his native city. Later he established his own private observatory at Trappes. His chief claim to fame is his discovery of the stratosphere, which he announced in 1881. He died Jan. 2, 1913.

Teixeira de Mattos, ALEXANDER LOUIS (1865-1921). Anglo-Dutch scholar and translator. Born at Amsterdam, April 5, 1865, he was brought to England in 1874. During the First Great War he occupied various positions in the war trade intelligence dept. His chief claim to fame, however, lies in his excellent translations of Masterlinck, Fabre, Couperus, Zola, Streuvels, Ewald, and others. Teixeira de Mattos died at St. Ives, Cornwall, Dec. 3, 1921.

War, in which the British were victorious over the Turks, is a hill 3,318 ft. high. It was the centre of a struggle lasting March 9-12, 1918, in which the British secured the high ground W. of the Jordan as far as Mt. Ephraim, during their advance upon Shechem. The Turks were driven headlong from the crest of the hill by troops of the 5th-6th R. Welch Fusiliers.

Tel Aviv (Heb., hill of spring). Jewish settlement combined in 1949 with Jaffa to form Jaffa-Tel

with a fountain and flower beds; there are blocks of flats, a beautiful seashore, a municipal park, a market: opera house and two theatres, symphony orchestra, Herzl college, and hospitals and clinics maintained by the civic authorities. Its factories make textiles, wire, sugar, and chemical and pharmaceutical products. From numerous publishing and printing houses come 40 periodicals and all Palestine dailies in the Hebrew language. The Levant



Tel-Aviv, Israel. General view of this Jewish city and the sea from the air. Upper picture, Dizengoff Square

Tekir Dag. Turkish name of the town described under its more familiar Grecised name Rodosto.

Tekrit. Small town of Iraq, 97 m. N.N.W. of Bagdad. It was the birthplace of Saladin. The British occupied it, Nov. 6, 1917.

Telamon. In Greek legend, brother of Peleus, and father of Ajax. He took part in the hunt for the Calydonian boar and the expedition of the Argonauts.

Tel Asur. Town of Palestine, E. of the Jerusalem-Nablus road, S.E. of Nablus and 2 m. N.W. of Ophrah; it is the Baalhazor of the Hebrews, the scene of the slaying of Amnon by order of Absalom (2 Sam. 13, v. 23).

The Tel Asur which gives its name to a battle of the First Great

Aviv, the largest city in Palestine. Tel Aviv was founded in 1909 as a suburb of the port of Jaffa, with 60 villas and bungalows. It developed rapidly after 1919 through immigration and had by 1946 183,200 inhabitants, nearly 30 p.c. of the Jewish pop. of Palestine. The pop. in 1949 was 300,000. The original residents were deported during the First Great War by the Turks, but had mostly returned by 1921, when Tel Aviv became an independent township. It was separated from Jaffa 1929-49. It has its own harbour for lighters, with quays 1,312 ft. long and a turnover of 196,000 tons in 1938.

Tel Aviv is a pleasant and hygienically constructed place. In the centre is Dizengoff Square,

Fair and Jewish Olympic Games are held here. As the economic and political centre of Palestinian Jewry, Tel Aviv was provisional capital of Israel 1948-50.

Telecommunications. Term generally applied to electrical communications by line, cable, or wireless. In the British Commonwealth, prior to 1928, internal telecommunications were government controlled; external cable communications being operated by private cable companies, and wireless communications by the Marconi Wireless Telegraph Co. and its subsidiaries. An imperial wireless and cable conference, 1928, recommended a merger of the competing companies; and Cables and Wireless, Ltd. was thereupon formed, and a Commonwealth communications council set up. After the Second Great War Lord Reith headed a mission to the Commonwealth to examine efficiency in telecommunications. His report was endorsed by a further Commonwealth telecommunications conference (1945) and was generally accepted by the British government. The recommendations included public ownership of all Commonwealth telecommunications services, with financial contributions by members of the Commonwealth. As a result of these recommendations Cable and Wireless Ltd. was duly nationalised in 1946. The financial arrangements were embodied in the Commonwealth Telegraphs Act, 1949,

which also established the Commonwealth telecommunications board to take over and extend the functions of the Commonwealth communications council.

Telegonus. In Greek mythology, son of Odysseus by the enchantress Circe. When he grew up to manhood, his mother sent him out in search of his father, and, shipwrecked on the coast of Ithaca, he began to ravage the country.

Odysseus and Telemachus went to meet the stranger, who, ignorant of his identity, killed his father.

Telephony (Gr. *têle*, far; *gonos*, offspring). Term for the supposed appearance in the offspring of characters derived, not from the sire of the offspring, but from a previous sire to whom the mother has borne offspring. There is little or no scientific evidence in support of the theory.

TELEGRAPHY: PRINCIPLES & HISTORY

H. K. Milward, A.M.I.E.E., and R. W. Hallows, M.I.E.E.

The invention of electric telegraphy begins with the discovery at the end of the 18th century that an electric charge can be conveyed along a conductor. Here is an account of its development. See also Kelvin, Lord; Morse, S. F. B.; Morse Code; Semaphore; Siphon Recorder; Wheatstone, Sir C.

Telegraphy (Gr. *têle*, far; *graph-
ein*, to write) is the transmission of messages between distant points by means of signals. Formerly applied to all forms of message transmission by signals, e.g. by smoke, flames, or reflected sunlight, the word has come to be generally used in the more restricted sense of transmitting code messages by electrical means.

Towards the end of the 18th century the discovery that an electric charge can be conveyed along a conductor gave rise to a whole series of ingenious inventions such as the pithball telegraph, which operated by friction-generated electricity and required a separate wire for each letter of the alphabet. Owing to their unreliability none of these inventions found a commercial use. In the year 1800 Volta introduced his continuous current pile, which was soon developed into the primary battery, giving for the first time a continuous and reliable flow of electricity. The discovery of electrolytic action followed, and with it the electrolytic telegraph (still using one wire per letter) in which letters were indicated by streams of gas bubbles in glass tubes. Although moderately reliable, it was slow and expensive, and came to nothing. Then Oersted's discovery of the electromagnetic effect in 1820 pointed the way; while the study of codes by Gauss and Weber showed that a combination of five signs was all that was necessary to cover the alphabet.

First Practical System

Samuel Morse, an American painter and sculptor, who was the first man to produce a practical telegraph system, conceived his telegraph in 1831 after reading Faraday's paper on electro-magne-

tic induction, and by 1835 his first model was made. His telegraph was a crude semi-automatic transmitter and receiver; the message was set up on a piece of wood by means of projections corresponding to the signals of the code. When this was passed through the transmitter the projections operated contacts as they went through. The receiver was simply a morse inker which recorded the code in dots and dashes on paper tape. Morse found that the instrument worked satisfactorily over 20 m. of wire. In 1836 he and Alfred Vail invented a relay which could be inserted into the line at intermediate points, thus increasing its range considerably. The code called after Morse he devised in collaboration with Vail in 1837. Shortly afterwards Morse abandoned the semi-automatic sender and substituted the hand-operated key. By 1844 Vail had introduced the sounder, having realized that anyone familiar with the code could read the clicks of the inker by ear. In 1839 a line, financed by congress, was erected from Washington to Baltimore and opened for business shortly after a demonstration before President van Buren. In 1844 Morse formed a private co. and built lines between New York, Baltimore, and Washington, and by 1851 50 telegraph cos. using Morse patents were operating in America. The Morse system had many advantages over others and was soon adopted widely also in Europe.

The development of telegraphy now became very rapid, for by 1860, telegraph communication was possible between most of the important cities of Europe, and a cable had even been successfully laid across the Atlantic, though its working life had been only

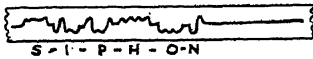
two weeks. The first successful Channel cable between England and France had been laid in 1851 and five or six were in operation by 1860. A second Atlantic cable was laid in 1865, but it broke before completion; the next year another was laid satisfactorily, and the one of 1865 was completed. The capacitance of these long ocean cables was enormous, and the amount of current obtained at the far end was minute; however, William Thomson, afterwards Lord Kelvin, had designed an extremely sensitive mirror galvanometer in anticipation of these difficulties, and it proved admirable. At first, owing to the high capacitance, the maximum speed of signalling was 3 words per minute, using cable morse; but with practice and improved instruments speeds increased to about 15 w.p.m.

On land, airline construction, very like that of nearly a century later, was most widely used. Underground cables were little used at first owing to their relatively high cost; but as the number of circuits increased, congestion of wires at main centres forced engineers to use underground cables leading to distribution points outside the towns. Gradually it was realized that the high cost was set off by the smallness of maintenance costs and by reliability, and in the U.K., except in country districts, the main overhead routes came to be maintained only as a stand-by.

High Speed Telegraphy

Of the multitude of instruments invented during the second half of the 19th century, the simple morse key and sounder were by far the most widely used. A workable type-printing machine, the Hughes, was invented in the U.S.A. in 1855. Baudot, in France, developed the idea, and it was successfully used in that country after about 1877 until superseded by the start/stop telegraph. High speed telegraphy was introduced by Wheatstone in his automatic telegraph. It used the ordinary morse code, and later models could, under ideal conditions, work at 500 w.p.m. Developments of this machine are used on wireless circuits. The siphon recorder has an extensive use on submarine cable terminations; though not quite as sensitive as the mirror galvanometer, it was nevertheless sensitive enough to be used on long submarine cables. The name "siphon" is derived simply from the method of supplying the pen with ink. In the record, dots

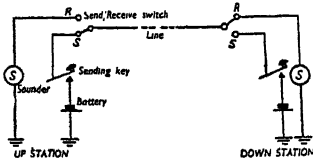
are represented by pips pointing upward and dashes by pips pointing downward (Fig. 1).



Telegraphy. Fig. 1. A typical record by siphon on tape paper

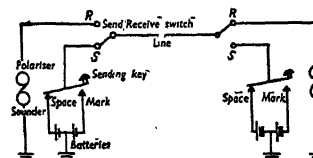
Wireless communication, predicted by Clerk-Maxwell, proved by Hertz, and made practicable by Marconi, began to change the picture soon after its first demonstration over a distance in 1897. Ocean cables decreased in importance, but slowly, for wireless was not without its troubles, such as atmospheric interference, fading, insufficient suitable frequencies.

ELEMENTARY THEORY. The first telegraph circuits were of the simplest possible kind, invariably using an earth return. The circuit shown in Fig. 2 is of the single-current type; that is, when the



Telegraphy. Fig. 2. Early single-current telegraph circuit

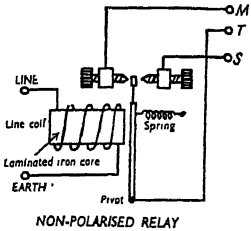
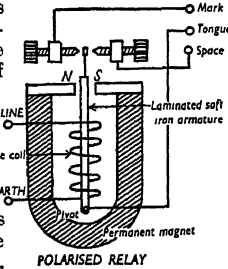
key is depressed, a pulse of current, called the marking current or mark, is sent to line; raising the key cuts off the current and is termed a space. The terms were suggested by the action of the morse inker, which marked the paper tape when the current was flowing and left a space when it was not. On long lines, where the receiving sounder or relay is working near its sensitivity limit, earth currents may become comparable in size with the marking currents and the instrument is liable to "stick" at mark. Double-current working overcomes this trouble by giving both mark and space definite line currents (see Fig. 3). The instruments are a little more complicated with the double-current system; the key must have three contacts, battery power is doubled for a given line current, and it is necessary to use a polarised sounder or relay, i.e. one which is sensitive to direction



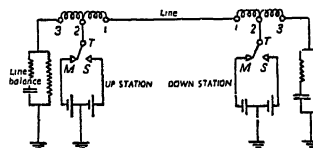
Telegraphy. Fig. 3. Double-current telegraph system

of current. Fig. 4 shows simplified diagrams of polarised and non-polarised relays.

The problem of making a telegraph line carry more than one communication, or "channel," is one which has engrossed engineers from the beginning of electrical telegraphy. The first advance in this direction was the duplex circuit, as opposed to those described above, which are simplex. The duplex circuit allows messages to be sent in both directions over a single line without mutual interference.

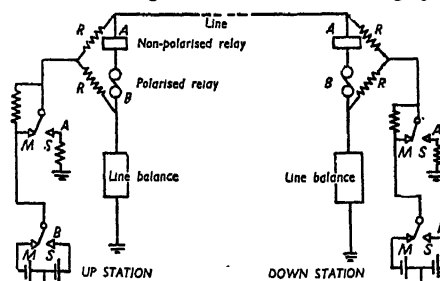


Telegraphy. Fig. 4. Left, polarised relay; right, non-polarised relay



Telegraphy. Fig. 5. Double-current differential duplex telegraph circuit enabling messages in both directions to be sent simultaneously

A double-current differential duplex circuit is shown in Fig. 5; it is so called because the relay has a centre-tapped line coil and operates on the difference of the currents flowing in the two halves.



Telegraphy. Fig. 6. Quadruple circuit by which two messages may be sent simultaneously in each direction

If all possible combinations of positions of the transmitting contacts at each end are considered, the resultant effect of the currents flowing is that the relay in one station is controlled only by the transmitting contacts in the other. An essential condition is that the line-balance and the line should be of equal impedance.

A development of this idea is the quadruplex circuit, which can deal with two messages in each direction simultaneously: Fig. 6 gives an example of such a circuit.

It is a combination of a double-current system, working to a polarised relay, and a single-current system, working to a less sensitive non-polarised relay, both being connected to line through a

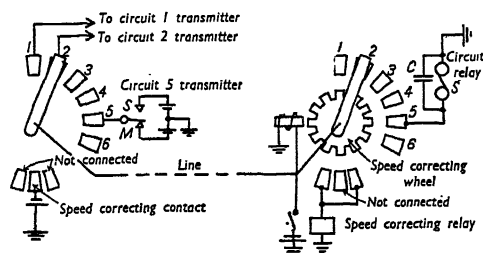
bridge duplex circuit. The bridge circuit ensures that the transmitting circuits in the "up" station affect only the relays in the "down" station. Transmitter circuit B produces the double-current signals, and A modifies the actual amount of current flowing. Of the two relays, B is very sensitive, and is affected by reversals of current; A is much less sensitive and operates on the size of the current and not on its direction. The system works satisfactorily on short lines.

No further increase in the number of channels per wire can be obtained satisfactorily without using synchronous distributors or by applying to line telegraphy a modification of radiomethods and using what is called a voice-frequency carrier system. Various multiplex systems using the synchronous distributor principle have been used in the past with varying degrees of success. The general principle is illustrated in Fig. 7. The distributor must rotate fast

enough to complete at least one revolution in the time of the shortest signal. Consider the telegraph transmitter which is connected to contact 5: when the key is on "mark," a series of short negative pulses is sent to line every time the distributor is in exact synchronism; these pulses are received on receiving contact 5 and on none of the others; the pulses charge the condenser C and discharge through the relay during the time occupied by the arm in sweeping over the other contacts.

When the transmitter changes to "space" the pulses to line are of opposite polarity and the relay

there are four rapid alterations between mark and space. The number of times per sec. that



Telegraphy. Fig. 7. The principle of the synchronous distributor telegraph system

changes over. Synchronism, which is obviously essential, is impossible to maintain without some correcting device, and some of the contacts on each distributor are therefore used for speed correction. If synchronism is exact, the synchronising pulse sent out to line has no effect on the receiver-correcting mechanism; but if the receiver motor speed is incorrect, the pulse accelerates or retards it until it is again in step. This correction process takes place at every revolution so that the distributors can never get much out of step before being corrected. In practice the number of channels which can be worked on such a system is limited to about six.

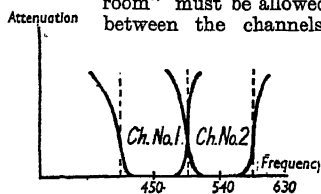
Telegraph speeds, codes, and maximum line-frequencies are to some extent tied up together. In order to get a measure of telegraph speed five letters and a space are taken to be the length of the average English word, and the number of such words per min. is the telegraph speed. To transmit these words in code a certain number of impulses is necessary, and the number per sec. is termed the line speed in bauds, a unit named after the French inventor Baudot. The relationship between telegraph and line speeds depends on the code used. With the morse code, which is an unequal-length code, an average length of any letter has to be taken, and this length is eight units; with cable morse, where no dashes are used, it is five units; with the five-unit start/stop code it is seven. In morse, one baud corresponds to 1.25 w.p.m.; in cable morse, 2 w.p.m.; in five-unit start/stop code, 1.4 w.p.m.

The transmission of any letter, figure, or sign by one of these code systems involves a number of changes from mark to space and vice versa. When H is sent in international or American morse,

mental frequency, but also harmonics up to the third; the third harmonic is a frequency three times the fundamental frequency. A speed of 50 bauds represents a fundamental frequency of 25 cycles per sec. To produce the necessary sharpness of signals at the receiving end, this would mean the transmission of frequencies of three times the fundamental, or 75 cycles per sec. In practice, instruments will work provided that the fundamental frequency is adequately reproduced; but it is normal to reproduce also a fair proportion of the third harmonic. If a telegraph channel is severely limited in frequency response (a long submarine cable, for instance), cable morse is the best code to use as it gives the highest word output for a limited line speed. Cable morse, however, is used only in such conditions, for an unequal-length code adds considerably to the mechanical complication of type-printing machines. The five-unit start/stop code is used for nearly all type-printing telegraph instruments.

Voice-frequency telegraphy was first tried at the turn of the 19th-20th century, but was unsatisfactory owing to the limitations of the apparatus then available. About 1920, however, when efficient types of band-pass filters, thermionic valves, amplifiers, and other apparatus began to be available, voice-frequency carrier systems for line telephony were reintroduced satisfactorily. The theory of modulation and demodulation of the carrier (detection) is essentially the same as in wireless; in the transmitter the tone is simply switched on and off and in the receiver a detector circuit turns the intermittent voice frequency into intermittent D.C. which operates the telegraph relay. As in wireless a tuned circuit is necessary to select the

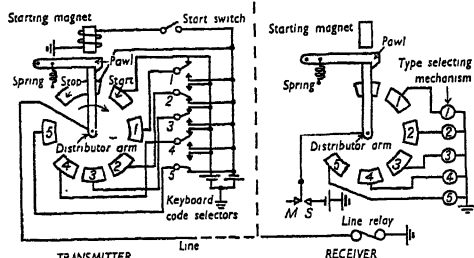
particular frequency required. For a teleprinter the line speed is 50 bauds, which corresponds to a fundamental frequency of 25 cycles with a third harmonic of 75 cycles; when used to modulate a carrier this causes a total side-band width of 150 cycles. Theoretically filters should be able to pass this band of frequencies, but in practice filters with a pass band of 100-110 cycles are perfectly satisfactory. By international agreement the band of frequencies which a speech channel must be capable of reproducing is from 300 to 3,000 cycles. There are, however, channels in use which cut off 2,500 cycles per sec.; consequently the region 2,500 to 3,000 is not normally used for telegraphy. The rest of the band is divided up in the U.K. into 18 channels; the voice frequencies used are 450, 540,.... up to 2,460 c.p.s. A typical response curve for the filters is shown in Fig. 8. The cut-off is not abrupt so that a certain amount of "elbow room" must be allowed between the channels.



Telegraphy. Fig. 8. A typical response curve of filter used in voice-frequency telegraph circuits

INSTRUMENTS. Instruments such as the sounder, morse key, automatic morse machine, and morse recorders of various types, although in use on some circuits, are becoming obsolete. The principal instrument in use is the teleprinter. It has a typewriter keyboard, uses the five-unit start/stop code, and prints either on a continuous gummed paper strip or on 84-in.-wide paper, according to the model used. The principle on which it works is illustrated in Fig. 9. In the rest condition a marking signal is sent continuously to line via the "stop" contact. This holds the receiver line relay to mark, so that the receiver starting magnet circuit is open. Depression of any of the keys on the keyboard closes the start switch and simultaneously sets the keyboard code selectors in the correct positions for the particular letter. The closing of the start switch operates the starting magnet which lifts the pawl and engages the clutch (not shown), so that the motor, which is running continu-

ously, drives the distributor arm round. The first contact it comes to is the start contact, which sends



Telegraphy. Fig. 9. The general principles of the teleprinter, which is now the most widely used telegraph instrument

a spacing impulse to line; at the receiver this causes the line relay to space, thus connecting the receiver starting magnet; this releases the pawl, engages the clutch, and starts the receiver distributor arm rotating. The motors are running at the same speed (within $\frac{1}{2}$ p.c. if the governors are adjusted correctly), so that as the contacts 1, 2, 3, etc. are connected in turn at the trans-

mitter, they are simultaneously connected in turn at the receiver; thus each of the type selecting elements receives a marking or spacing pulse according to the code originally set up in the transmitter. At the end of one revolution the pawl re-engages and the clutch disengages in both the transmitter and receiver, leaving the mechanism ready to start again.

In the practical teleprinter an arrangement of cams and contacts replaces the distributor but the principle remains the same. The great advantage of the start/stop instrument over its predecessors using synchronous motors is that instead of having to keep exact synchronism over long periods, the motors must simply be running so nearly at the same speed as not to get out of step by the width of one contact during one revolution.

Automatic tape machines developed from the Wheatstone high speed automatic equipment are used extensively over wireless circuits. The most common type uses the morse code and is developed directly from the original Wheatstone. The transmitter uses a tape punched by a special perforator with a typewriter keyboard. The receiving apparatus is called an undulator; it is a development of the siphon recorder and draws a similar sort of wavy line on paper tape. This paper tape passes in front of trained operators who can read it at approx. 40 w.p.m. and record it on typewriters or teleprinters.

A more fully automatic system which can be used on good wireless circuits has transmitting apparatus which is almost exactly the same as that of the high-speed morse type except that it uses the five unit code. The tape is punched either by a keyboard perforator or by a perforator fed from a distant teleprinter. The receiving portion, coupled to the wireless receiver, is simply another perforator, and the tape which it punches is fed into a second transmitting apparatus working at the normal teleprinter speed, its signals being used to operate a teleprinter. The advantage of this over the high-speed morse system is that trained operators are required only at the terminals; the tape-

TELEPRINTER CODE

5 Unit Code

Letters	Fig.	Units			
		● = mark			
A	-	●			
B	?	●			●
C	:		●	●	
D	ANS BACK	●			●
E	3	●			
F	%	●		●	●
G	m		●	●	●
H	£			●	●
I	8		●	●	
J	BELL	●	●		●
K	(●	●	●	
L)	●			●
M	.			●	●
N	,			●	●
O	9				●
P	0		●	●	●
Q	1	●	●	●	●
R	4		●		●
S	'	●		●	
T	5				●
U	7	●	●	●	
V	=		●	●	●
W	2	●	●		●
X	/	●		●	●
Y	6	●		●	●
Z	+	●			●
Letters		●	●	●	●
Figures		●	●	●	●
Space				●	
Car. return					●
Line feed		●			

machine operators have a comparatively easy job, and one man can attend to several automatic machines.

CIRCUITS. Single and double current D.C. circuits are used for telegraphs only in remote country districts, and for local "ends" between teleprinter rooms and main equipment centres. The chief means of telegraph communication over land line or cable is by voice frequency, and the 18 channel equipment is becoming standard for main circuits in the U.K. A simplified schematic diagram is given in Fig. 10. The carrier frequencies used are all generated in a composite motor generator, whose speed of rotation is accurately controlled. The modulators simply switch on and off the voice frequencies supplied by the motor generator, and the demodulators are comparable with detectors used in wireless sets. It is normal to use one speech channel (300-3,000 c.p.s.) for the 18 channels in

INTERNATIONAL MORSE CODE

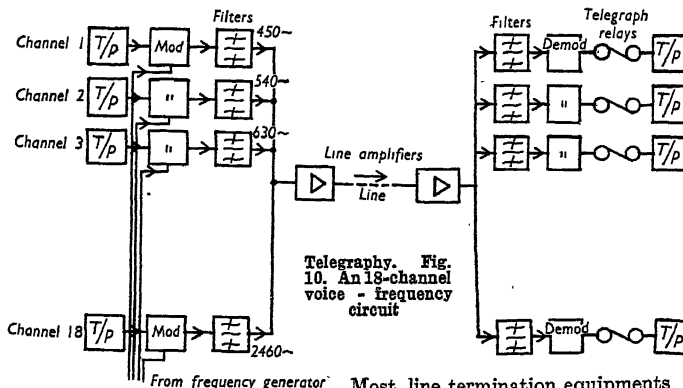
	NORMAL	CABLE
A	— · —	— · —
B	— — · —	— · — · —
C	— — — ·	— · — · — · —
D	— — — —	— · — — —
E	—	— · —
F	— · — —	— · — · — · —
G	— — — —	— · — — —
H	— — — —	— · — — —
I	— — — —	— · — — —
J	— — — —	— · — — —
K	— — — —	— · — — —
L	— — — —	— · — — —
M	— — — —	— · — — —
N	— — — —	— · — — —
O	— — — —	— · — — —
P	— — — —	— · — — —
Q	— — — —	— · — — —
R	— — — —	— · — — —
S	— — — —	— · — — —
T	— — — —	— · — — —
U	— — — —	— · — — —
V	— — — —	— · — — —
W	— — — —	— · — — —
X	— — — —	— · — — —
Y	— — — —	— · — — —
Z	— — — —	— · — — —
1	— — — —	— · — — —
2	— — — —	— · — — —
3	— — — —	— · — — —
4	— — — —	— · — — —
5	— — — —	— · — — —
6	— — — —	— · — — —
7	— — — —	— · — — —
8	— — — —	— · — — —
9	— — — —	— · — — —
0	— — — —	— · — — —

the outward direction, and a completely separate speech channel for the inward telegraph channels.

When a wireless telegraphy circuit of the on-off keying type is used for any form of automatic printer, difficulties at once appear, unless the signal-to-noise ratio is much better than is usually found on long-distance links. A good operator can pick out his signal from noise and interference even when it is weaker than the noise; an automatic instrument cannot do so. Some success has been achieved with teleprinters working over wireless circuits by modulating the carrier with two tones, one for mark and the other for space, these two tones being separated by filters at the receiver. The

leakage resistance; "meggers" are also used, but caution is required here, as some underground cables will not stand the high voltages used. In a type of test equipment using the radar principle a short pulse is sent out to line and is reflected back from any point at which there is a discontinuity; the distance to that discontinuity is measured in exactly the same way as is the range to a target by radar.

Instrument test equipment includes the stroboscope for adjusting the teleprinter speed, the distortion measuring set which measures the distortion of a telegraph signal over any system, and the transmission measuring set for adjusting the power level of signals at various points on the system.



Telegraphy. Fig. 10. An 18-channel voice - frequency circuit

filters cut out a great deal of the noise, but the signal-to-noise ratio over the wireless circuit must still be good before accurate printing can be assured.

A successful development in this field is the use of frequency modulation or "carrier-shift." Here the carrier remains at constant amplitude and changes frequency for mark and space; in the receiver this varying frequency is reconverted into intermittent D.C. by a discriminator circuit. The system is superior to the two-tone system, but it fails at a signal-to-noise ratio which an experienced operator would still consider quite good.

High speed automatic morse with each message sent twice is still superior on long-distance circuits where the signal-to-noise ratio is not good enough for carrier shift. It is, however, wasteful in trained operators.

TEST EQUIPMENT. Much of the line test equipment in use in 1948 had altered little from that of 1900. Simple D.C. instruments are used to measure continuity and

Most line termination equipments include a test panel containing the appropriate testing units.

COMMUNICATION SERVICES. Normal telegram and cablegram services all over the civilized world are maintained by a network of telegraph systems. Within the U.K. most of the large towns are directly interconnected, although teleprinter exchanges are used to some extent; to countries overseas wireless and submarine cable circuits are used.

Specialised internal services also exist in some countries, chiefly to facilitate commerce. In the U.K. there are the telex and printergram services. The telex equipment is simply a teleprinter coupled to a voice frequency unit: communication is established by telephone and the telex apparatus switched into circuit by means of a change-over switch. This gives direct teleprinter communication between the two correspondents, and is quicker and cheaper than using the public telegraph service. Printergrams are an extension of this service, enabling a subscriber to use his telex to send telegrams

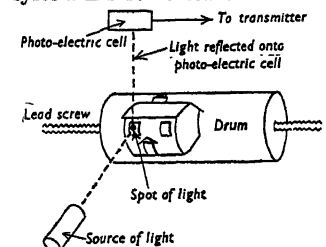
on the normal public network. Main telegraph centres are equipped with telex machines and when the subscriber asks the exchange for printergrams the telex operator is put on the line.

STILL PICTURE TRANSMISSION. Suppose that any photograph is sliced up into, say, 100 narrow strips. Each will be something like what is seen in Fig. 11: it will consist of light and dark patches of varying sizes and shades.

Telegraphy. Fig. 11. Still picture transmission. Diagram showing the appearance of one of the large number of strips into which the picture is sliced

Each line can be transmitted separately by telegraphy, and when they are properly recombined at the receiving end a facsimile of the original image appears. The greater the number of lines into which the transmitted picture is broken up, the more faithful and more detailed is the copy at the receiving end.

In still-picture transmission no actual slicing up is done. The image is resolved into narrow lines in the way indicated in Fig. 12. The photograph to be transmitted is wrapped round a revolving drum, which is carried steadily from right to left by the action of the lead (pron. "lead") screw. A minute but intense spot of light from a fixed source is focused on to the photograph. As the latter rotates and is carried from right to left, the light spot describes a helical path over the whole of its surface, slicing the image into one long narrow strip. One British system has 104 threads to the in.

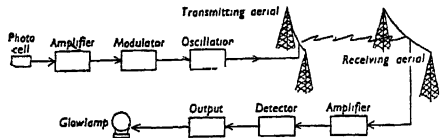


Telegraphy. Fig. 12. The principle of still picture transmission

As the spot passes over the surface of the image, the amount of light reflected varies from moment to moment according to the shade of the particular part it is passing at any instant. This reflected light is applied to a photo-electric cell, where similar fluctuations are produced in the cathode-to-anode electron current which can be transmitted

over telegraph wires or used to modulate the carrier wave of a radio transmitter.

At the receiving end of a still-picture service, reversion of the electrical copies into light fluctuations must be carried out. Fig. 13 shows diagrammatically the methods of both transmission



Telegraphy. Fig. 13. Still picture transmission. Skeleton diagram of radio system

and reception by radio. The output of the receiver is fed to a special type of glowlamp, whose brilliance varies in exact accordance with the electrical pressure applied to its filament. The light from this lamp is focused by means of a system of lenses into a tiny spot. This spot falls on the surface of a sensitised photographic film wrapped round a drum and housed in a chamber which is otherwise light-proof. The drum is carried on a lead screw of exactly the same type as that used at the transmitter, and the fluctuating intensity of the spot of light from the glowlamp builds up as it traverses the rotating film a negative reproduction of the transmitted photograph. Synchronising devices ensure that the transmitter and receiver drums revolve at exactly the same speed so that at any moment the light-spot on the receiving film has travelled exactly as far from its start as had the spot traversing the original photograph at the transmitter. The average time taken to transmit a picture 5 ins. by 7 ins. from e.g. London to Melbourne is 7 to 12 mins.

Tel-el-Kebir, BATTLE OF. Victory by a British force under Sir Garnet Wolseley over an Egyptian army led by Arabi Pasha, Sept. 13, 1882. After the battle of Kassassin Aug. 28, the British were concentrated to attack the main enemy position, about 2½ m. long, at Tel-el-Kebir, which was held by 38,000 Egyptians with 60 guns.

The British army consisted of about 15,000 men. The advance began at 11 p.m., terminating after a march of about 6½ m. in an attack at daybreak. The battle began by an assault on the enemy's trenches by the Highland brigade. A few minutes later the attack became general, the enemy evacuating the trenches, only to be slaughtered by the cavalry which had

worked round the Egyptian left, or by the Indian contingent, now posted so as to intercept fugitives at the bridge over the canal. By 6 a.m. the battle was over, nearly 2,000 Egyptians having been killed and over 500 wounded, as against British losses of 58 killed and 401 wounded and missing.

Next day the British cavalry pushed forward to Cairo. There they secured the surrender of 15,000 Egyptian troops in the city, which was entered by Wolseley on Sept. 15. See Egypt.

Telemachus. In Greek mythology, son of Odysseus and Penelope. He was an infant when his father left to take part in the Trojan War, but after twenty years had passed without Odysseus reaching home, Telemachus set out to look for him, visiting Nestor at Pylos and Menelaus at Sparta. On reaching home again, he found that his father had arrived, and assisted him in slaying the suitors for Penelope's hand. In Homer Telemachus is the ideal of a loving and dutiful son. See Odysseus. *Pron.* Te-lemma-cus.

Telemark, TELLEMAR, OR TELEMAREN. Maritime fylke or co. of S. Norway, formerly called Bratsberg. It is mountainous, well watered, heavily timbered, and contains several large lakes. The rivers flow S.E., and discharge into the Christiania Fjord. A romantic mountain region, considered the finest in S. Norway, lies in the W. of the fylke. Here is the Skien-Dalen steamer route through the Telemarken canal, a waterway completed in 1892 to connect Ulefos with the Bandak lakes. The inhabitants are mainly engaged in lumbering and fishing. The capital is Skien (*q.v.*). Its area is 5,837 sq. m. Pop. 129,854.

Telemeter (Gr. *têle*, far; *metron*, measure). This is another name for Range-finder (*q.v.*).

Teleoceras. Sub-genus of fossil rhinoceros. They were short-skulled, short-footed, three-toed, and hornless. Remains of the animals are found in the Lower Miocene and Lower Pliocene deposits of Europe and America.

Teleology (Gr. *telos*, end; *logos*, theory). In general, the doctrine of final causes, all speculation in reference to the idea of purpose, not only in man's conscious actions but in all natural and historical processes. In teleology, the teleological argument is that the evidence of design in

nature proves the existence of a personal God. Teleology is opposed to the mechanical theory, which would explain all phenomena by the law of mechanical causation. Teleology insists that it is impossible to regard such phenomena as the progressive development of the animal world culminating in man, as the result of the accidental cooperation of blind natural forces, and that such an assumption would deprive the idea of morality of all significance.

Mechanical determinism, on the other hand, holds that no aim is in itself strong enough to ensure its realization; that that which follows is always the necessary consequence of that which precedes, and that a final result can never be considered a determining cause. Teleology held the field till the rise of modern philosophy, when it was repudiated by Descartes, Spinoza, and Bacon in favour of "operating causes." Leibniz attempted a compromise, asserting that everything in the world took place in accordance with mechanical laws, but that these laws themselves were teleologically determined to produce the most perfect results. Kant also found elements of truth in both doctrines. The teleological view was entirely driven into the background, especially by the Darwinian theory; in the 20th century there has appeared a tendency to reassert the doctrine in biology.

Teleosaurus (Gr. *teleos*, perfect; *sauros*, lizard). Fossil marine crocodile found in rocks of the Jurassic period. The animal was remarkable for a long pointed snout armed with a large number of small teeth, and for a body covered with bony tuberculated plates. See Dinosaur.

Teleostei (Gr. *teleos*, perfect; *osteon*, bone). Group of fishes in which the skeleton is well ossified. The spinal column consists of distinct bony vertebrae, the pectoral arch has a collar-bone, and the head a mandible or bony lower jaw. The gill chamber is covered by a bony shield or operculum, and the body is clothed with symmetrical scales. Teleostean fishes are by far the most abundant of the known species, and include such well-known and diverse forms as the eels, herrings, salmon, cod, flat fishes, perch, blennies, etc.

Telepathy (Gr. *têle*, afar; *pathkein*, to feel). Communication between two minds apart from the ordinary sense channels. Since about 1876, when Prof. Sir W. F.

Barrett drew attention to such phenomena, the existence of the faculty has slowly gained acceptance, though not yet universally admitted. Spontaneous cases include hallucinations and other impressions referred to a person who, unknown to the percipient, is dying, passing through a crisis, or thinking of the percipient. The frequency of these coincidences appears to preclude chance. In many carefully conducted experiments, the percipient had named a high

proportion of playing cards, copied diagrams and sketches looked at by the agent, described scenes thought of, or objects tasted or smelt, localised pains, etc. There is also a curious and as yet unexplained tendency to describe cards, etc., before they are looked at by the agent. See Apparition; Hypnotism; Psychical Research; Subliminal Self. Consult Telepathy, W. Carrington, 1947; Telepathy and Medical Psychology, J. Ehrenwald, 1947.

TELEPHONY: PRINCIPLES AND HISTORY

R. W. Hallows, M.I.E.E., Author of *Wireless Simply Explained*

This article on the direct transmission of intelligible sounds should be read in conjunction with those on Radio and Telegraphy. See also Appleton Layer; Bell, A. G.; Marconi, G.; Microphone; Pupin, M. I.; Thermionic Valve

Telephony (Gr. *têle*, far; *phônê*, sound) is the transmission of recognizable sounds, in particular of the human voice, over distances beyond the range at which such sounds can be heard without aids. The word is normally used to denote transmission by electrical means, though it was formerly applied to mechanical systems such as the speaking tube and the string or tight-wire telephone.

The fundamental processes of telephony are:

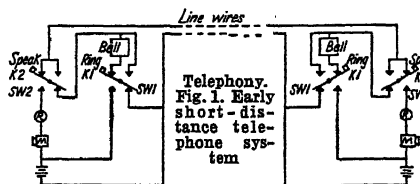
I. *At the sending end:* (a) the conversion of sound waves into fluctuations of electric current by means of the microphone; (b) the transmission of these fluctuations either directly over the wires of a circuit (line telephony) or in the form of a modulation envelope applied to a carrier frequency. The carrier may consist either of an oscillating electric current in a wired circuit (carrier-current telephony) or of electromagnetic waves sent through the ether (wireless telephony).

II. *Between the sending and receiving ends:* in line and carrier-current telephony, amplification by means of repeaters, placed at intervals of about 25 m., to make good the loss of signal strength due to attenuation.

III. *At the receiving end:* the reconversion of electrical current fluctuations into sound waves, in line telephony by applying the incoming currents to the telephone receiver; in carrier-current and wireless telephony by demodulation or detection, which involves removing the carrier and one of the side bands, reconstituting the original audio frequency fluctuations of current, and applying these to the receiver. In wireless telephony, where amplification by repeaters between sending and re-

ceiving ends is impossible, high frequency amplification, preceding the detector stage, and audio frequency amplification, following the detector stage, may be required.

IV. *Calling system.* In line and carrier-current telephony, a call system is required, using a bell, lamp, falling shutter, or other device. In wireless telephony



Telephony. Fig. 1. Early short-distance telephone system

either a constant watch or a watch between pre-arranged hours is usually kept. No special electrical calling system is needed. Each station has its "call sign," consisting of a combination of letters and numbers. The operator gives his own call sign and either that of the station (or stations) he wishes to contact or the words "Hallo CQ," meaning that he is calling all stations.

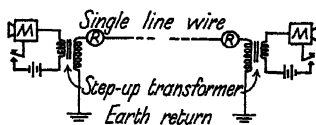
The electric telephone was the invention of A. Graham Bell, who, when professor of vocal physiology at Boston, U.S.A., demonstrated successfully in 1876 the transmission of sounds by electrical means. With improvements and modifications, Bell's instrument is essentially that in use today.

The chief handicap to the early development of telephony was lack of a means of amplifying an electric current. In passing over the wires of a circuit a current must expend some of its energy in overcoming the opposition, or resistance, presented by the conductors. Line telephony currents are of the alter-

nating kind; with these the energy lost in overcoming resistance, or the power loss, is I^2R , where I is the current in amperes and R the resistance in ohms. This power loss is called attenuation. If attenuation is to be minimised in a circuit containing no power amplification, the resistance must be kept as small as possible, or the power in the line must consist of a high voltage and a low current, rather than a low voltage and a high current. The microphone operates with a low voltage and a comparatively high current. Hence the earliest telephones, using simple circuits of the kind seen in Fig. 1, could be worked over only very limited lengths of wire.

The operation of such a telephone was as follows. Normally the switches SW1, SW2 at either end are kept by springs in the "stand-by" position shown in the drawing. In that position both batteries are cut out of circuit. Suppose that A wishes to call B. He presses down his K_1 , which causes his battery to actuate B's bell. He then releases K_1 , and awaits the answering ring, which B gives by depressing and releasing his K_1 . This done, A and B both depress and hold down K_2 . The bells are now cut out, and the two microphones, the two receivers, and the two batteries are connected in series through the line wires. At the end of the conversation A and B both release K_2 and the instruments return to the stand-by position.

Improvements came thick and fast. One of enormous importance is illustrated in Fig. 2, where the output of the microphone is seen applied to the primary of a



Telephony. Fig. 2. Diagram illustrating the use of the step-up transformer and single line earth return circuit

step-up transformer. In this way the line voltage could be greatly increased and the line current correspondingly reduced, with the result that losses were smaller and operation could take place over a far greater length of wire. Alternatively, the cost of installing short distance telephone links was reduced, since wire of smaller

gauge could be used. Ringing over long distances remained a problem until the introduction of the polarised bell, operated by a hand-driven magneto generator. As alternating instead of direct current was now used for ringing, high line voltages and small currents could be used for this purpose as well.

The circuit in Fig. 2 consists of a single wire with earth return, the regular form in the early days of the telephone. It was fairly good for short distance working, though overhearing was a common trouble. In the 1890s, when telephony over distances of 200 m. and more was in use, the increasing use of electrical machinery in factories and elsewhere led to so much noisiness in earth return circuits that the system was abandoned in favour of the entirely metallic circuit.

Switching became more complicated inside the instruments, but much simpler for the user. When the instrument was not in use the microphone, later a combination of microphone and receiver called the hand set, hung from a hook, depressing it by its weight and causing it to keep a switch in the stand-by position. In this position the microphone battery was cut out of circuit and the ringing circuit was made; turning the crank handle of the generator rang the bell at the other end of the line. When the hand set was lifted off, the hook



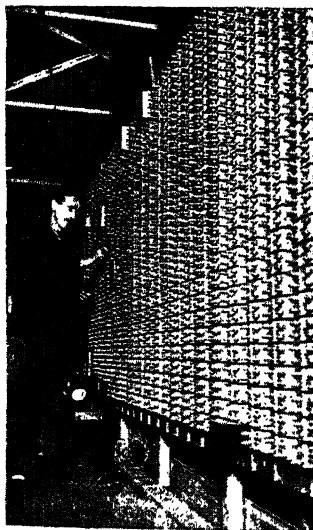
Telephony. Faraday Building, London, is one of the largest telephone exchanges in existence, and through its international switchboard Great Britain is connected to large centres all over the world. Here operators are handling calls on the trunk switchboard

was raised by a spring; the bell was cut out, and the battery switched into circuit with the microphone; in many cases, though, the switching in of the microphone battery was not automatic; it was done by means of a "pressel switch" in the hand set, which had to be kept closed by the fingers during a conversation.

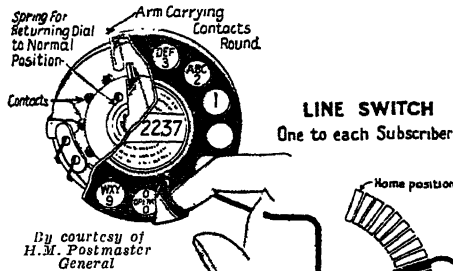
Drawbacks to this system are that there must be a microphone battery, requiring frequent attention, in each subscriber's home; and the pressel switch may cause trouble. A great improvement was the central battery system (C.B.S.) which uses a single large battery at the exchange both for signalling and for supplying current to the microphones. The instrument in the subscriber's home consists of a pedestal bearing a "cradle" on which the hand set rests when the instrument is not in use. In this position a switch is kept open, breaking the circuit between the battery and the microphone. When the hand set is lifted a spring causes the cradle to rise. The microphone is switched into circuit and, in a non-automatic exchange, an indication is given to the operator there. This may be the lighting up of a lamp or, at exchanges where there is no operator on all-night duty at the switch board, the ringing of a bell. On receiving the signal the operator turns a key to the "speak" position, cutting out the calling circuit and connecting the subscriber to her head set. She then takes the number required and (if it is a

local call) plugs the caller into it and rings the subscriber who is being called. If the call is to another exchange "controlled" by her, she rings that exchange, passes the number, and connects her subscriber. Otherwise she connects him to Toll or Trunks as the case may be. For all calls beyond a certain radius an automatic timer is switched in. This records the time occupied by the conversation and emits three warning "pips" just before the end of each three minutes. When the subscribers replace their hand sets on the cradles their microphones are cut, the timer (if in use) is stopped, and a signal at the operator's switchboard shows her that the line has been cleared. She then disconnects both subscribers, returning their circuits to the stand-by state.

An invention greatly increasing distances over which speech could be conveyed was the Pupin loading coil, patented in 1899 by M. I. Pupin of Columbia university. The insertion of these coils at regular intervals into telephone cables causes the cables to behave as if their inductance were substantially uniform throughout. The result is reduced attenuation and therefore improved results. Loading is of the greatest advantage in the case of underground cables, used for all main trunk lines, as well as for the lines in all big towns and cities between exchanges and from subscriber to exchange. Another was the valve repeater, an automatically operated valve amplifier, which began



Telephony. An engineer at work on one of the automatic distributor boards of the internal exchange on Paddington station, London. There are more than 1,000 departmental connexions



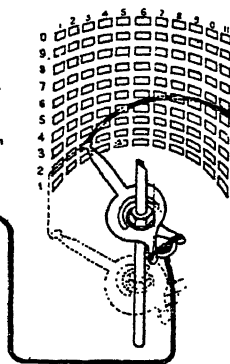
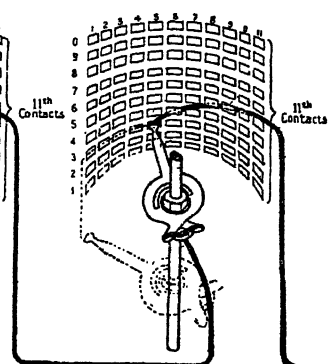
to come into use in trunk lines soon after 1918. They are inserted into all trunk lines at intervals of about 25 m. Attenuation is made good, the proper balance of the audible frequencies is preserved, and speech over distances of hundreds or even thousands of miles is as strong and as clear as it is on local calls. The submarine repeater, developed by engineers of the G.P.O., and installed in one of the cables between England and Ireland, consists of a hermetically sealed metal cylinder containing specially designed valves with a working life of more than 20,000 hrs.—about 20 times that of those used in broadcasting receiving sets. Both high tension and low tension current for the valves is supplied through the cable from the shore. Every valve has one or more stand-by replacements within the metal cylinder. Should any valve break down, or become inefficient through long service, a replacer is automatically switched into circuit. The submarine repeater is designed to work for years without attention.

The C.B.S. telephone exchange has many disadvantages. It requires operators to be on duty at all times at the switchboards; at small exchanges the operator may sit for long spells with almost nothing to do; at large and busy exchanges she may at times be so overwhelmed by the volume of calls that the human factor leads to errors. The idea of an automatic exchange was conceived early in the history of the telephone. The first man to work out a practical automatic system was Almon B. Strowger, of Kansas City, an undertaker by trade, who took out his first patent in 1889. It was for a crude system requiring five wires between each subscriber and his exchange; but it included the basic principles upon which a practical automatic exchange was developed, and eventually adopted all over the world. The rotating dial, operated by the finger of the

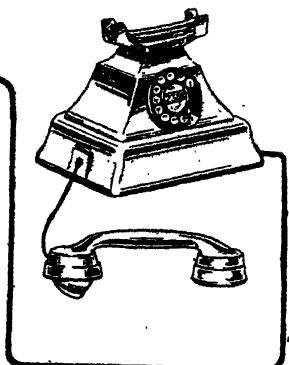
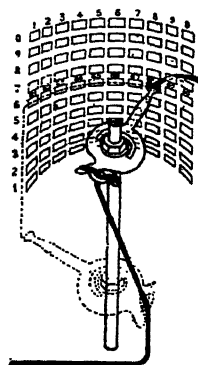
caller, was patented in 1898 by W. P. Thompson.

In the dial system each exchange has a three-figure number, and each subscriber a seven-figure number, the first three digits identifying the exchange by which he is served and the other four constituting his personal number on the exchange switchboard. Numbers consisting of seven digits are not easy to memorise; combinations of letters and numbers are much simpler. Hence on the dial in the U.K. the letters ABC correspond with the figure 2; DEF with 3; GHI with 4, and so on. The only figures which have no corresponding letters are 1 and 0. Suppose one wishes to call a friend whose number is SLEepy Hollow 1769; the wanted number is actually 7531769; but it is a good deal easier to remember the three letters SLE plus the figures 1769.

When the hand set of a telephone connected to an automatic exchange is resting on its cradle the central battery is cut out of circuit with the microphone. At the same time the subscriber's bell is so switched that it is brought into action, should the automatic ringer at the exchange come into play. When a subscriber lifts the hand set from its cradle, the selectors at the exchange are brought under his control. If he dials the three letters which are those of his own exchange, these remain passive. But

1ST SELECTOR2ND SELECTOR.

FINAL SELECTOR.



Telephony. Diagram showing the working of the automatic telephone. The number 2368 is here seen being called by the number 2237, and it is clearly shown what happens as the digits are dialled and contacts are engaged

should he dial the letters of another exchange or, e.g., the TOL (805) of Toll, selectors at his own exchange pick out a disengaged line to whichever of these it may be, connect him to it and switch in the automatic ringer. But let us suppose that the call is a local one from EGGshell 2237 to BIRdsnest 2368. On receiving BIR (247) the home exchange selectors find a disengaged line (if there is none, the "engaged" signaller is brought into play), over which 2368 is passed to the second exchange. Here the selectors pick out the eighth unit of the sixth ten of the third hundred of the second thousand and cut in the ringer or the "engaged" signaller as the case may be. If BIR 2368 answers, replacement of the hand sets at the end of the conversation causes all the moving parts at the exchanges to return to their stand-by positions, and the call is automatically charged to the subscriber who made it. Advances in automatic telephony will almost certainly render both

Toll and Trunk exchanges unnecessary. Any subscriber will then obtain connexion to a subscriber in any part of the country simply by dialling the required exchange and individual number.

So far, no means has been found of making telephony possible over submarine cables, save over such comparatively short spans as the Irish Sea, the Strait of Dover, and the narrower parts of the North Sea. The submarine repeater cannot be installed in more than moderate depths of water, or at places more than a short distance from the shore. So great is the attenuation over a submarine cable that for many years it seemed impossible that telephonic communication across the Atlantic would ever be established.

Transoceanic Telephony

But in 1901 Marconi succeeded in transmitting wireless signals between England and the N. American continent; and the thermionic valve made transoceanic telephony a possibility. At first there were great difficulties. It was believed that the only way of spanning great distances was by the use of high-powered transmitters using very long waves. On the long waves atmospheric interference frequently makes telephonic communication impossible. Between the First and Second Great Wars amateur radio enthusiasts clamoured to be assigned bands of wavelengths on which they could carry out experiments. As a sop they were given bands of short wavelengths below 100 metres, which the experts of the day had declared to be useless except for very short-range working. But the amateurs were soon reporting successes at ranges of hundreds and even thousands of miles, though their transmissions were made with very small power behind them. The experts revised their opinions and, thanks to the pioneer work of the amateurs, the development of short-wave radio made possible world-wide radio telephony.

Short-wave radiations can be focused into a comparatively narrow beam, and their energy is not therefore dissipated in all directions as is that of long-wave transmissions. The short-wave transmitter's aerial system is designed to concentrate the greater part of the radiated energy towards the receiving station or stations with which it is working. Hence a much smaller output power suffices; and smaller output power rating means transmitters which are less costly to install and maintain.

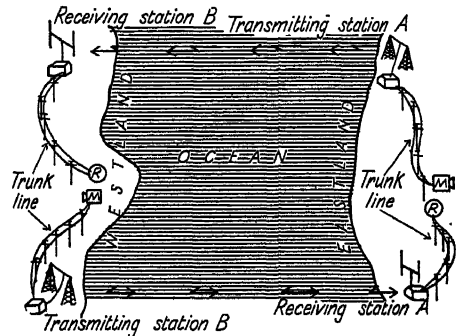
Short waves, however, behave curiously, and in its early days transoceanic radio telephony was neither very good nor very reliable. Research showed that there are optimum bands of wavelengths for particular times of the day and night, for particular seasons of the year, and for particular periods of the eleven-year sunspot cycle. Every long-distance radio telephone service, therefore, must be so designed that it can make use at any time of the most suitable group. Even so, another complication arises: except at ranges of a few miles, the short waves reaching the receiving aerial are reflected from the Appleton or F layer, which is about 180 m. above the earth's surface.

If only one set of waves were reflected on to the receiving aerial, all would be well. But trains of waves reflected from two or more points in the F layer continually reach it simultaneously. The paths that such waves have followed are not all of the same length; hence it is purely a matter of chance whether they arrive in phase, partly out of phase, or completely out of phase. When they are in phase the signal is abnormally strong; partial dephasing reduces the strength; complete dephasing means silence, if the waves are of equal amplitude. The process is called fading.

Normally, short waves are polarised by the transmitting aerial so that the electric field is vertical and the magnetic field horizontal. When reflection from the F layer takes place the waves may be "twisted" by an alteration in the directions of the electric and magnetic fields. This leads to distressing distortion of speech, which at times may become unintelligible. A method called diversity reception was devised to reduce fading. If two receiving aeriels are arranged an appropriate distance apart, and two sets of reflected waves arrive at each, the phase relationship will be different at each at any instant. When signals at aerial A are very weak those at B may be strong or *vice versa*. Both aeriels serve a common receiver, which is provided with a device that automatically selects the in-

put from the "best" aerial at the moment and rejects that of the other. In this way the input to the receiver can be kept substantially constant and the effects of fading are minimised.

A method was also devised for dealing with "twisted" waves at a large and very successful short-wave receiving station, M.U.S.A. (Multiple Universally Steerable Aerial), installed by the G.P.O. in the Romney marshes. The total length of the M.U.S.A. aeriels is more than 15 m. The system combines spaced-aerial diversity reception with what may be termed angular diversity reception. Suppose that two sets of waves are arriving from different points in the



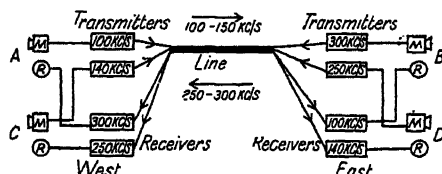
Telephony. Fig. 3. A country's transoceanic transmitting and receiving stations are usually situated a long way from one another. The illus. shows diagrammatically that during a conversation the route from the microphone of a subscriber in Eastland to the receiver of a subscriber in Westland is quite different from that between the Westland microphone and the Eastland receiver

reflecting layer, one badly twisted from its original polarisation, the other less twisted or not twisted at all; the two will come in at different vertical angles. The M.U.S.A. aeriels are so arranged that any one receives only those waves arriving at a particular vertical angle. At the receiver an ingenious device selects at any instant the input from the aerial which is giving the smallest amount of fading and the smallest amount of distortion. Changes from aerial to aerial may be made many times a sec. when conditions are bad, but these are imperceptible to the listening ear. At all times both the volume and the quality of speech reception are maintained substantially level, so that a trans-Atlantic conversation is very nearly as strong, clear, and free from background noises as a local one between two subscribers belonging to the same exchange. The system is used for trans-Atlantic items in B.B.C. programmes.

The transmitter and the receiver of a long-distance radio telephony

system are, as a rule, a long way from one another. Fig. 3 shows diagrammatically what happens when a transoceanic conversation is in progress. The microphone of the speaker in Eastland is connected through his own exchange and a trunk line to transmitter A, whose radiations are picked up in Westland by receiving station B and passed over trunk and local lines to the listener in Westland. When the latter speaks he does so through transmitter B. Receiving station A passes the incoming signal over another trunk line and so to the telephone receiver of the listener in Eastland.

One early difficulty about using radio for long-distance telephony was that there was no kind of secrecy about such communications. Though they were "beamed," the beam was a comparatively wide one and anybody living in the area which it reached could overhear conversations by means of a short-wave receiving set. That



Telephony. Fig. 4. Illustrating the principle of carrier current telephony. In the simple example described in the text carrier frequencies of 100 and 140 are used for transmission from west to east, and 250 and 300 kcs. from east to west

drawback was overcome by the invention of the method of transmission called "scrambling." Put simply, this means that a "scrambler" at the transmitting end mixes up the speech frequencies reaching the microphone. The result (as any owner of a set capable of receiving short-wave transmissions may hear for himself) is a series of sounds which, though obviously those of speech, are completely unintelligible. They can be made understandable only if at the receiving end there is a "descrambler" so adjusted that it restores the proper balance of the original speech frequencies.

Besides its use for long-distance services short-wave radio telephony provides connecting links across estuaries or between mainland and island. Its cost is far less than that of laying an underwater cable. The radio links are often of the "unattended" type, entirely automatic in action and needing no operator, though maintenance men visit them regularly.

As with telegraphy, the efforts of telephone engineers have been

directed towards making the maximum possible use of a single pair of wires. Various duplex and multiplex systems were evolved so that two or more conversations could take place simultaneously over the same pair; but the really big advance came when modified radio methods were applied to line telephony to produce the carrier current system. In broadcasting, each station has its own individual frequency and sends out a carrier wave of that frequency modulated by the audio frequencies occurring in the studio. The owner of a receiving set can bring in any broadcasting station within the range of his apparatus by tuning it to that station's carrier frequency. Each station has a channel extending to 4.5 kcs. above and below its carrier frequency. A similar system can be used over a suitable pair of wires.

Consider the very simple system illustrated diagrammatically in Fig. 4. When A is speaking a carrier current with a frequency of 100 kcs. is modulated by the transmitter to which his microphone is connected. This is received, detected, and passed on to B's telephone receiver by receiving equipment tuned to 100 kcs. B replies by way of his transmitter, a 300 kcs. carrier and A's receiving equipment tuned to that frequency. C can speak simultaneously to D and D reply to C by the use of carrier currents with respective frequencies of 140 kcs. and 250 kcs. If the receiving apparatus is sufficiently selective, no mutual interference or overhearing takes place. Trouble would occur at the repeater if steps were not taken to prevent it; A's speech transmission, for instance, might be amplified at the

it not for the filter circuits (Fig. 5), which act as traffic

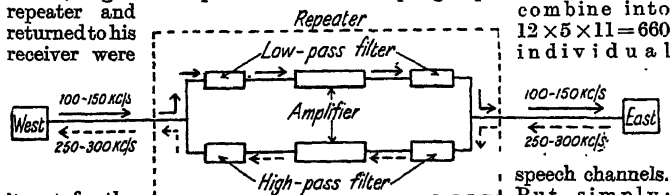
controllers and allow any transmission to pass only in its proper direction. A low-pass filter accepts frequencies below a predetermined level (here 150 kcs.)

and rejects all those above this level. Thus the 100 kcs. and 140 kcs. transmissions of A and C are passed to the "outwards" amplifier. Having passed through this amplifier they are prevented by the high-pass filter from going back through the "inwards" amplifier. Similarly, the transmissions from B and D are suitably directed by the filters which they encounter.

The range of modulation frequencies needed to produce understandable speech is much smaller than that required by broadcasting stations for the transmission of music: about 500-3,000 or 3,500 cycles is sufficient for practical purposes. Nor is there any need to send both the modulation side bands: one can be suppressed; the carrier frequency itself can be suppressed. What goes into the line wires may be described as the narrow band of frequencies which would represent one side band of a modulated carrier frequency—if the carrier were there. To receive "single" side band, carrier-suppressed transmissions, the carrier frequency, removed at the transmitting end, must be restored by locally generated oscillations in the receiver, but that presents no difficulty.

With the co-axial cable laid on many of the important telephone trunk routes a very large range of frequencies can be transmitted faithfully. Its cost is high—£5,000 or more per mile—but this is amply justified by the fact that the carrier current system used by the G.P.O. allows 660 simultaneous telephone conversations to take place over one pair of co-axial cables without mutual interference.

Fig. 6 shows how frequencies in a co-axial cable are built up by a progressive modulation system: 12 channels form one of 55 groups; 5 groups are combined into one of 11 super-groups. The super-groups combine into $12 \times 5 \times 11 = 660$ individual



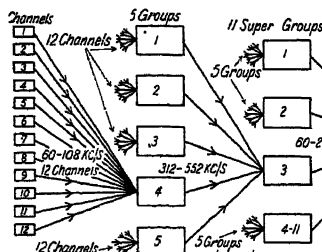
Telephony. Fig. 5. Showing the arrangement of a repeater with filters suitable for the conditions seen in Fig. 4

speech channels. Put simply: the frequencies allotted to each channel, includ-

ing those used for ringing, range up to 4,000 cycles or 4 kcs. These are used in channel No. 1 of each group to modulate a carrier current with a frequency of 64 kcs.

This would normally result in a band of frequencies extending from 60 to 68 kcs. One side band however, is suppressed and the channel frequency becomes 60-64 kcs. The frequency of each No. 2 channel is 64-68 kcs. and so on to No. 12, with a frequency of 104-108 kcs.

At group stage No. 4, the 60-108 kcs. frequencies of the 12 channels are made to modulate a 564 kcs. carrier current; only the lower side band is retained and the resulting output of the group is the band of frequencies from 564-108 to 564-60=456 to 504 kcs. A 1,116 kcs. carrier at super-group No. 3 is modulated by the entire range of frequencies extending from 312 to 552 kcs. from five groups. Again, one side band is removed and the frequency range from super-group to line is 1,116-552 to 1,116-312=564 to 804 kcs. The frequencies built up in the co-axial line by the 11 super-group units ranges from 60 to 2,788 kcs.



Telephony. Fig. 8. The principle of through-group working, enabling 680 separate speech transmissions to be made simultaneously over one co-axial cable

Telephotography. Photography by means of a lens of special type, permitting of photographs of large scale being taken from a distant standpoint. This telephoto type of lens consists of one of ordinary pattern with a negative or diverging lens behind it; or the two may be constructed as one instrument. Such lenses, while calling for an extension of camera only three or four times the ordinary, yield photographs on a scale equivalent to that given by lenses ten to twenty times the focal length. A telephoto lens allows clear snapshots to be made, and is extensively used in many forms of sporting photography.

The term is also inaccurately used to refer to the electrical transmission of pictures over wires, first carried out by Bidwell in London in 1881. See *Telegraphy: Still Picture Transmission*.

THE TELESCOPE AND ITS USES

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In connexion with this article see others on astronomical subjects, e.g. Astronomy; Mars; Moon; Planets; Sun, etc. See also Lens; Optical Glass; and the biographies of Herschel and other astronomers

The telescope (Gr. *tēle*, far: *skopein*, to see) is an instrument formed by a combination of lenses, or of mirrors, or of both, for the purpose of seeing distant objects distinctly.

There is reason for thinking that the method of combining lenses to form an instrument like a telescope was known to Roger Bacon (d. 1294), though there is no evidence for the existence of the instrument at that date. Leonard Digges (d. c. 1570) is also said to have known the principle of the telescope, his knowledge being derived from a manuscript book of Bacon, but its invention is generally associated with the name of Johan Lipperhey or Lippershey, a spectacle-maker of Middelburg, Holland, who announced his discovery in Oct., 1608. Other persons to whom the credit has been assigned are James Metius and Zacharias Jansen, also a spectacle-maker of Middelburg, contemporaries of Lipperhey.

Though it is impossible to trace the inventor or maker of the first telescope, it is generally agreed that Galileo in Italy and Simon Marius in Germany were the first to apply the telescope to astronomical observation. In fact, Galileo is credited with having found out the principle of the telescope himself; and his early additions to astronomical knowledge were made by its aid.

The essential feature of a telescope is a lens or mirror, called the objective, which collects more of the rays emanating from any point of a distant object than would otherwise enter the eye, and bends or reflects them so that they unite in a point called the focus. There is a focus for each point of the distant object, and these combine to form an image of it in the focal plane of the objective. This can be seen by placing the eye about 1 ft. beyond it, but is ordinarily examined more closely with a lens or combination of lenses termed an eyepiece.

The function of the objective is to gather sufficient light to make a perceptible image in the focal plane. The function of the eyepiece is to enable the eye to see that image when as near to it as possible, so that the angle which it will subtend at the eye may be large. In early telescopes, the objective

was a convex lens, and the eyepiece concave, the latter being placed between the objective and its focus. This type is known as the Galilean, and the picture seen by the user is direct or upright, whereas in the instrument invented by Kepler in 1611 the eyepiece is a convex lens or its equivalent and is placed farther from the lens than its focus, and the image of the object is seen inverted. Kepler's form of telescope was not brought into use until the middle of the 17th century. The terrestrial telescope, or spyglass, is of this type: the image, which is inverted by the object glass, is re-inverted by means of an eyepiece formed by a combination of four lenses.

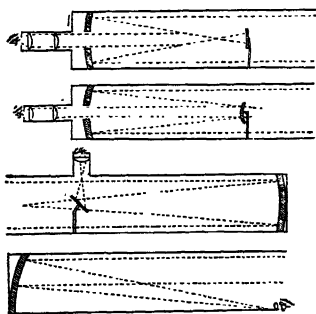
Aberrations and their Remedy

Early telescopes suffered from two defects, known as aberrations. Spherical aberration gives an indistinctness to the image because, if the surfaces of the lenses are parts of spheres, all the rays which emanate from a point of the object do not meet after refraction precisely at a point. The second defect, chromatic aberration, the cause of which was not known until Newton's discovery of the spectrum, gives spurious colours to the image, because the lens is, in effect, a collection of prisms.

To obviate these defects long telescopes were made, and at the end of the 17th century telescopes were in use, having small object glasses, but were as much as 200 ft. in length and very unwieldy. From about 1760 the colour defect was removed by making achromatic object glasses of two lenses combined: a convex one of crown glass and a concave one of flint glass. The flint lens does not destroy the convergence produced by the crown lens, and it re-unites the colour rays at the same single focus.

REFLECTING TELESCOPES. Before the invention of the achromatic object glass, it was recognized that a concave mirror with a reflecting surface of parabolic shape would unite, at the focus of the paraboloid, the parallel rays which fell over its surface, and that this would supply an objective free from aberrations. James Gregory, 1663, was the first to give a complete explanation of the construction of a reflecting telescope. The objective of such an instrument is

a mirror placed at the end of a tube, the other end of which is open to the sky. In some forms, a hole is pierced through the centre of the mirror, and the rays passing into the tube are reflected from the object mirror on to a smaller one within the tube, which, in the Gregorian telescope, is concave. From this they are reflected through the aperture in the objective, and pass through an ordinary eyepiece.



Telescope. Top to bottom, Gregorian form of telescope; Cassegrainian type; Newtonian, with eyepiece in side of tube; Herschelian telescope, allowing direct examination without aid of second reflector. See text

Newton altered this scheme by dispensing with the hole in the mirror, making the second mirror plane, and setting it at an angle of 45° to the axis of the tube, that it might reflect the light through an aperture in the side of the tube to an eyepiece. In 1672 Cassegrain, a Frenchman, devised a form similar to the Gregorian, the difference in construction being that the second mirror was to be convex instead of concave.

William Herschel made nearly 200 mirrors of all sizes, the largest being the reflector of 4 ft. diameter and of 40 ft. focal length. He altered the plan of the reflecting telescope by tilting the objective mirror with respect to the tube, so that the reflected rays emerged through an aperture in its side, and the image is seen directly by an eyepiece without the interposition of a secondary mirror.

MODERN TELESCOPES. With the advent of photography, telescopes were designed to use it. For this purpose the eyepiece is dispensed with, the image being formed directly on the photographic plate. The processed plate is afterwards examined under a low-power microscope, which performs the function of an eyepiece.

The principal development of the late 19th and early 20th centuries was a great increase in diameter of the objective lens or

mirror, the aim being to collect more light. The practical limit to the size of a refracting telescope is set by the difficulty of making large blocks of homogeneous glass. Telescope mirrors were originally of speculum metal, a brittle, heavy alloy of copper and tin, which tarnishes and has to be refigured by a skilled optician. In 1856 a chemical process was discovered for depositing metallic silver in a thin, highly-reflecting layer on glass; and it became possible for a large mirror to be made of glass only one-third the weight of metal, optically figured once for all and then silvered and resilvered as the coating tarnished. After 1935 it became common to use, instead of silver, an aluminium coat deposited by evaporation in a high vacuum. This tarnishes less easily and reflects ultra-violet light better.

The reflector has the great advantage of achromatism: its main defect is its restricted field. Images of objects more than a fraction of a degree away from the axis are blurred by the defect called coma. The Schmidt telescope, invented in 1931, enables a field about 15° across to be covered by using a spherical mirror and correcting its aberrations by means of a specially shaped glass plate at its centre of curvature.

The location and size of the largest telescopes in the world are given in the following table, in which M signifies a mirror objective, L a lens, and S a Schmidt-type

system; the date is that of completion:

M Mt. Wilson, Calif.	100 in.	1917
M McDonald, Texas	82 in.	1939
M Raddcliffe, S. Africa	74 in.	1948
M Mt. Palomar, Calif.	200 in.	1947
L Lick, Calif.	36 in.	1888
L Meudon, France	33 in.	1889
L Yerkes, Wis.	40 in.	1897
L Potsdam, Germany	31 in.	1899
S Tonanzintla, Mexico	26 in.	1942
S Mt. Palomar, Calif.	48 in.	1948

Telescopes are mounted for use in various ways according to the purpose for which they are designed. Instruments of comparatively small size are used as sighting instruments, the principal type of this description being the meridian instrument or transit circle (*q.v.*). In the equatorial mounting the telescope is suspended on an axis parallel with the axis of the earth, and is rotated, generally by mechanical means, in a direction opposite to that of diurnal rotation, with the result that the object under observation remains constantly in the field of view.

Bibliography. *The Study of Stellar Evolution*, G. E. Hale, 1909; *The Telescope*, L. Bell, 1922; *Telescopes and Accessories*, G. Z. Dimitroff and J. G. Baker, 1945; *Telescope Objectives*, H. D. Taylor, 1946.

Telescopium. Southern circumpolar constellation. Named by Lacaille, it is between Ara and Sagittarius. Its chief star is Alpha Telescopii, an early type star of about the fourth magnitude.

TELEVISION AND ITS PROGRAMMES

R. W. Hallows, M.I.E.E., and Maurice Gorham, former B.B.C. Television Director

The principles of television, the history of its development, and the method of its application are here described. Closely related subjects are Radio and Telegraphy. See also articles on Baird, J. L.; Cathode Ray Tube; Cinematography; Photography

Television is a term coined to express the transmission, by electrical means, to distant places of images of events as they occur, and the reception of such images. Though inventors had been engaged for many years in attempts to evolve methods of transmitting images over wires or by wireless, it was not until the 1920s that J. L. Baird devised the first practical working system. Regular broadcasts by the Baird method were made for a considerable time from the London medium-wave broadcasting station. The received images were reddish-brown in colour, small, flickering, and not very distinct. They were of low definition, but they were recognizable. For a time Baird conducted medium-definition transmissions from his experi-

mental station at the Crystal Palace, London; then in 1936 the high-definition station at the Alexandra Palace, London, came into action. For some months broadcasts were made on alternate days by the latest Baird system and that developed by E.M.I. The latter was, by general consent, voted the better. It was adopted by the B.B.C., and, with modifications and improvements, continued to be the standard British system.

During the Second Great War the Alexandra Palace station was closed to prevent its use as a radio landmark by German bombers on their way to London. It was reopened in 1946; and other stations, including one at Sutton Coldfield near Birmingham, were planned

so that all but the sparsely populated areas of the U.K. should be served by at least one television transmitter.

PRINCIPLES OF TELEVISION. The deviser of a television system has to find a means of converting into electrical impulses something which affects one of the human sense organs. He must find a way of making electro-magnetic waves convey faithful copies of those electrical impulses. He must contrive a means of interpreting the impulses borne by electro-magnetic waves in such a way that they convey an intelligible message to the sense organ concerned.

The eye can send to the brain an instantaneous detailed impression of a small object fairly close to it, or of larger ones at greater distances. But it cannot see at a glance the whole detail of, for instance, a large oil painting 6 or 8 ft. away. Quite unconsciously, a man scans the surface of the canvas by quick horizontal and vertical movements of the eyes. The area he can see in detail if by an effort of will he keeps his eyes fixed on a point in the middle of a large picture is surprisingly small, and only portions of the message put on the canvas by the artist can be received at any instant. By rapidly scanning the picture, the eye enables the brain to build up a complete and detailed impression of the whole.

Any page of the New Universal Encyclopedia contains a great deal of information. No eye could glance at a page and instantly convey the whole of that information to the brain. What the eye does in reading is to scan the page, travelling first from left to right along one line of print and then switching back much more rapidly to the beginning of the next line below. The movement of the eye over a page is thus a combination of horizontal and vertical travel: a moderately slow horizontal traverse from left to right is followed by a rapid "fly-back" from right to left, with a downward movement to the start of the next line.

Suppose that a page of print 6 ins. deep and containing 30 lines each $3\frac{1}{2}$ ins. long, is read in one min. Then the eye's horizontal scan works out (including the rapid fly-backs) at 7 ins. in each 2 secs., or an average of $3\frac{1}{2}$ ins. a sec. The vertical scan is 6 ins. in 60 secs., or $\frac{1}{10}$ of an in. a sec. The page is thus covered by a combination of a rather rapid horizontal scan and a much slower vertical scan.

That is exactly how television apparatus sends and receives its images. The earliest systems made use of a scanning disk, containing 30 equally spaced apertures of small size placed near its rim and forming a portion of a spiral. The disk, revolving $12\frac{1}{2}$ times a sec., was placed between a powerful light source and the object to be "televised." At any moment only the pencil of light admitted by one aperture fell upon the object. As the disk revolved, this pencil of light traversed the object in a narrow line. As soon as one aperture had allowed a spot of light to pass across the object the next took up the work. The light-spot again traversed the object, but, owing to the spiral form of the array of apertures, the line described by the spot of light now followed a path parallel to and just not overlapping the one before it. In this way the whole image was broken up into 30 parallel lines, each traversed once by the spot of light at every revolution of the disk, and each consisting of patches of varying size and of shades ranging from pure white through many different greys to dead black.

As the spot passes over the object, light is reflected from the portion of the surface illuminated at any instant. From pure white dots and patches there is maximum reflection; from those which are dead black, no reflection at all; from those of intermediate shades a greater or less amount of light is reflected according to the degree of their greyness.

The Photo-Electric Cell

This reflected light can be applied to a photo-electric cell, which passes an electric current proportionate to the amount of light reaching it. In this way the fluctuations of the light reflected as the scanning spot traverses the object are converted into corresponding fluctuations of electric current, and these latter fluctuations are made, after amplification, to modulate the output of a wireless transmitter. The action of the photo-electric cell in converting light-wave fluctuations into electric current fluctuations is parallel to that of the microphone in its conversion of sound-wave fluctuations into current fluctuations. The essential difference is that whereas the microphone receives and conveys an impression at any instant of all the sounds reaching it, the message reaching the television transmitter and sent out by it concerns at any instant only one minute element of the whole image.

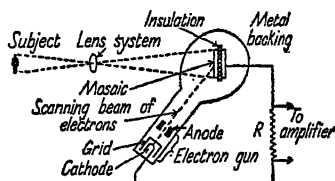
At the receiver the image is built up on the viewing screen not as an instantaneous whole, but dot by dot and line by line. This is made possible by that quality of the eye called persistence of vision—a quality exploited also by the cinematograph. Images formed on the retina of the eye do not instantly disappear when the object by which they are caused is removed. At any moment there is actually nothing on the viewing screen of the television receiver but a single minute spot of light, whose brightness is in proportion to the shade of the dot, or picture element, then being received. Thanks to persistence of vision the tiny individual picture elements recorded on the screen build up on the retina the impression of a complete picture.

The Scanning Disk

In early television receiving equipment a scanning disk was used. The incoming wireless waves were amplified, detected, and again amplified. The messages conveyed by the modulation were converted into corresponding fluctuations of electrical pressure. These were applied to a special form of glow-lamp, whose brilliance was thus correspondingly varied from instant to instant. The scanning disk, revolving in exact synchronisation with that of the transmitter, was interposed between this source of light and the large lens which formed the viewing screen. In this way the image, dissected at the transmitter, was rebuilt on the retina of the viewer's eye. Scanning disks ceased to be used, the cathode-ray tube in one form or another taking the place of both photo-electric cell and glowlamp. But the basic principles of television remain the same.

TELEVISION TECHNIQUE. Both in the studio and for outside broadcasts a television camera, the emitron, or iconoscope, is used. These cameras are so sensitive that transmissions have been made from theatres with no addition to the normal stage lighting. Out of doors the television camera has often sent clear images to the television screen when the light was so poor that the spectators on the spot had difficulty in following a game. The principle of the emitron is illustrated diagrammatically in Fig. 1. By means of the lens system the image is focused on to the mosaic screen, which consists of a vast number of minute photo-sensitive elements, insulated from one another and from the metal backing. Each element.

together with the metal backing, forms a tiny capacitor which becomes positively charged to a



Television. Fig. 1. The principle of the iconoscope

voltage proportionate to the amount of light falling upon it. The result is that an electrical copy of the image is formed on the mosaic, the individual charges of the photo-sensitive elements each recording one small detail of the picture. The iconoscope contains also an electron gun, with focusing and deflecting arrangements (not shown in the drawing) similar to those used in the ordinary cathode-ray tube. The beam of electrons from the gun is made to scan the mosaic by means of horizontal and vertical time bases in exactly the same way as the eye scans this column in reading it.

Electrons are negative particles of electricity; as the beam reaches each tiny positively charged element of the mosaic the capacitor formed by this element and the back plate is discharged. This causes a flow of current through the resistor R and, in accordance with Ohm's Law, a corresponding potential difference across R. These potential differences, each recording the "message" imprinted by the image on one tiny cell of the mosaic, are used, after amplification, to modulate the output of the transmitter.

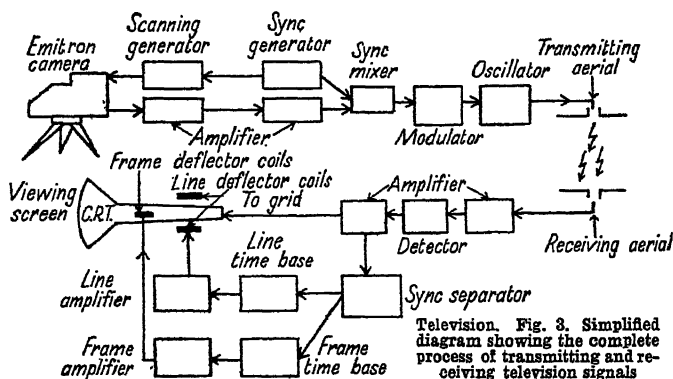
The way in which the vision carrier wave is modulated is illustrated in Fig. 2. Pure white leaves the carrier at its ordinary level. Dead black brings its amplitude down to 30 p.c. of normal, and the various grades of grey produce percentages of the normal carrier between 31 and 99: the paler the grey, the higher the percentage of the carrier.

This is the British system. It is precisely the opposite of that used in the U.S.A., and in some other countries. In other words American vision signals would give a negative image on a British television and vice versa.

Carrier percentages below 30—the region sometimes referred to

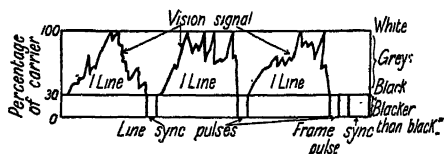
as "blacker than black"—are used to convey the synchronising pulses. In television parlance synchronising and synchronisation are usually shortened to "sync," pronounced "sink."

Fig. 3 shows diagrammatically the whole process of transmission and reception. From the television transmitter two modulated carriers, one carrying the vision signals and the other the sound signals, are sent out on different frequencies. (The sound transmitting and receiving apparatus is not



Television. Fig. 3. Simplified diagram showing the complete process of transmitting and receiving television signals

shown.) Both are picked up by the receiving aerial and in most cases both are amplified by the first H.F. stages of the receiver. Then vision and sound signals are sorted out into their own circuits by means of filters. After amplification, the image-detail parts of the vision signal (those, that is, corresponding to carrier percentages between 30 and 100) are fed to the grid of a cathode-ray tube in the form of varying positive voltages. The grid of the tube is so negatively biased that the voltage due to the modulation corresponding to dead black is just not sufficient to allow any flow of electrons from the cathode across



Television. Fig. 2. Illustrating the modulation system used in British television

the tube. The screen thus remains dark. Voltages corresponding to less and less dark greys allow the electron stream to be denser and denser, with the result that the spot of light is more and more brilliant. It reaches full brilliance when a positive voltage corresponding to white reaches the grid.

The illumination of the receiver screen is thus varied in exact accordance with the amount of light on the tiny cell of the transmitter iconoscope mosaic which is discharged at any instant by the scanning beam.

To "paint" the image on its screen, scanning must also take place in the receiver; the spot of light, fluctuating in intensity, must be made to move over the screen. And it must at any instant be at exactly the same point of the receiver screen as that reached on

the mosaic by the transmitter's scanning beam. A device called the sync separator picks out the sync pulses from the vision signal; it applies the short line-sync pulses to the line time base, which controls the horizontal movements of the spot, and the long frame-sync pulses to the frame time base, which controls its vertical movements. The output of the time bases is applied to the deflector coils, for a magnetically controlled tube is almost always used for television. If the line time base is properly designed and adjusted, the line-sync pulses ensure that the receiver light-spot starts each line at the same instant as the scanning beam starts its journey across the mosaic and covers the whole line in exactly the same time. Each little element of the line is thus painted in at precisely the right place. Similarly the frame time base ensures that each line fits into its proper place, and that the scan of each complete image starts and finishes simultaneously in both transmitter and receiver.

Under the British system each complete image is built up by 405 scanning lines. But the lines do not run consecutively from 1 to 405. The odd-numbered lines, Nos. 1, 3, 5, and so on, are first scanned, and build up a rather sketchy "frame," with gaps be-

tween the lines. The next frame is made up of the even-numbered lines which fill in the gaps. Each frame occupies $\frac{1}{25}$ sec., and a completely scanned image is produced 25 times a sec.; $202\frac{1}{2}$ lines go to each frame.

In the U.S.A. 525 lines (interlaced frames of $262\frac{1}{2}$ lines each) are used; but the quality and definition of a television system do not depend simply upon the number of lines used. A large number of scanning lines transmits good, detailed images only if the transmitter is able to deal without distortion with a very wide band of modulation frequencies. The same is true of reception and the receiver.

Examination through a magnifying glass of any of the photographs in this volume will show that its surface consists of a large number of tiny dots, or picture elements. The television image is also made up of picture elements, stippled-in in series as the scan progresses. The number of elements in a television image is found by squaring the number of scanning lines and multiplying this by the form-factor, or aspect-ratio, which is the ratio of the long side of the image to the short. In the B.B.C.'s transmissions 377 lines are used for scanning, 28 out of the 405 being needed for the sync pulses. Thus the total number of picture elements is $377 \times 377 \times \frac{4}{3} = 177,661$. If the image consisted entirely of alternate black and white elements (Fig. 4A), one complete voltage cycle would be required for each pair (Fig. 4B). To transmit such an image 25 times a sec. would call for modulation frequencies of $25 \times 177,661 \div 2 = 2,222,000$ cycles a sec., or 2.222 megacycles. As large parts of every image are the same shade, this sort of thing does not happen, and about one-tenth of this frequency range would suffice. But suppose that the transmitted image contains fine, equally spaced black and white vertical lines. What takes place during part of each horizontal scan is shown diagrammatically in Fig. 4. Unless special measures were taken, the corresponding impulses would be of sine-wave form as seen

at B and the reproduced image would be as at C. Pure whites would be reproduced only at the crest of each wave and dead blacks only at its trough. Instead of being sharp and distinct, the vertical black and white lines built up by a succession of horizontal scans would be blurred and muzzy. They would in fact appear not as vertical lines at all, but as parts of an indistinct patch of grey.

Ideally the modulating impulses from such an image should have the perfectly square wave form seen at D. At the receiver (assuming it to be of good design) there would then be the same instantaneous transitions from black to white and vice versa; the lines would be reproduced clearly and distinctly as at E. Theoretically the transmission of a square wave form requires the modulation to contain an infinite number of frequencies. In practice, adequate results are obtained from a finite though large number of frequencies. Though only some 2.22 megacycles would be needed to transmit the 377 lines of the average image with the kind of haziness indicated in Fig. 4C, the B.B.C. transmits modulation frequencies up to 2.7 megacycles.

The test diagram sent during the morning transmissions makes it possible to check the response of the receiver. The sets of fine vertical lines correspond respectively to 1.0, 1.5, 2.0, 2.5, and 3.0 megacycles. A good receiver should resolve the 2.5 megacycles lines clearly.

A great deal of work is being done on both colour television and stereoscopic television, but it may be a long time before either is economically practicable. Television suitable for magnification to full cinema screen size is in a more advanced state of development.

R. W. HALLOWS

TELEVISION BROADCASTING. Television is capable of conveying visual information and entertainment of every kind. Like sound broadcasting it comes directly into the home, and like the theatre and the cinema it appeals to the eye as well as to the ear. It can even be used for transmitting printed mat-

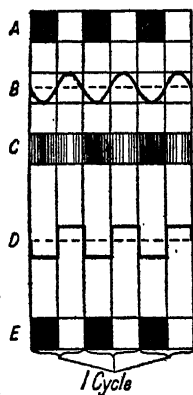
ter in facsimile. The limitations on its growth arise chiefly from the complexity of the apparatus needed at both producing and receiving ends and the consequent high cost of providing high-quality television, especially outside densely-populated areas.

These limiting effects have been apparent ever since the first regular service of high-definition television was started in London in 1936, and can be seen in the slowness with which television has spread to other parts of the world except the U.S.A.

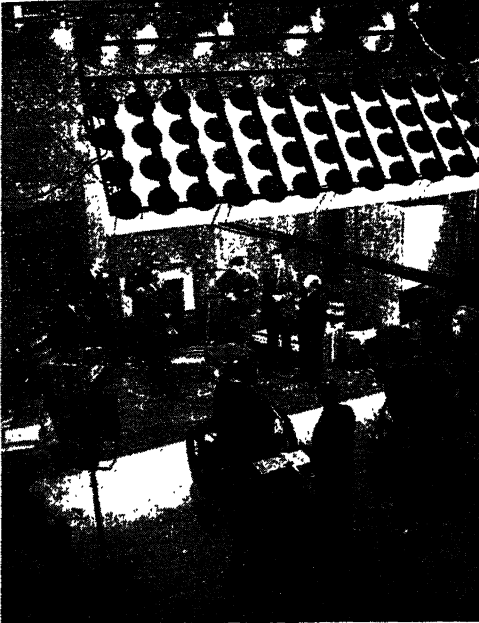
Most of television's early successes were in the realm of actual events: the coronation procession of George VI, 1937, the Victory parade, 1946, the Olympic games, 1948, were landmarks in British television, as the Louis-Conn fight of 1946 and the Philadelphia political party conventions and the presidential election campaign of 1948 were in the U.S.A.

Actual events of all kinds, from public parades to street scenes and work in progress, provide television with ready-made material, and the new medium inevitably leaned heavily on them in its earlier days, as sound radio did on music. But for the reluctance of the film industry to cooperate with a possible rival, it would no doubt have depended largely also on transmitting ready-made films. From the beginning, however, productions created in the television studio proved to have as great an appeal as outside spectacles, and the straight play running for 90 mins. or more—about the length of a cinema film—became the backbone of British television.

Television can direct the audience's attention at will to any part of the scene or any significant detail in it, whilst excluding the rest; the television producer has direct control of the production whilst it is taking place; and television gains in effectiveness over both theatre and cinema from the fact that "viewers" see it in the intimacy of their own homes. Ballet can be presented with a degree of selective emphasis that cannot be achieved on the stage; so to some extent can variety and revues, in which the face of a comedian, the feet of a dancer, or the hands of a conjurer can be shown in close-up whenever the producer chooses, without any break in the action. Music gains least from the addition of sight to sound, though some "viewers" welcome the chance of studying at close quarters the fin-



Television. Fig. 4. Showing that unless precautions were taken the voltage wave form corresponding to the scan of picture elements at (A) would be as at (B). Such voltage variations applied to the grid of the receiving C.R.T. would reproduce (A) in the way shown at (C). The ideal square voltage wave form at (D) would reproduce (A) perfectly as at (E).



Television. Televising a studio play at the B.B.C. transmitting station at Alexandra Palace, London

gering of a pianist or the antics of a dance-band drummer.

Every sort of programme known to sound radio has been attempted in television, from the straightforward talk and short story to the elaborate feature programme which combines filmed actualities, dramatised reconstructions, and expert speakers in the studio.

In the sphere of information the potentialities of television are almost unlimited. To see a thing is normally more convincing than to be told about it, and television's increasing facilities are accompanied by developments in the technique of visual reporting. Eventually, when television stations are many and are linked together so that what is happening in one country may be seen simultaneously in another, when pictures are clearer, more detailed, larger, and, ultimately, in natural colour instead of black-and-white, with receiving sets plentiful and cheap enough to find their way into the ordinary home, the television screen will form the chief means of contact of the ordinary household with the outside world.

Maurice Gorham

Telford, THOMAS (1757-1834). British engineer. Born at Westerkirk, Dumfriesshire, Aug. 9, 1757, he learnt the trade of a stonemason, and in 1783 settled in London. In 1787 he became surveyor of public works for Shrop-

shire, and in 1793 was appointed engineer in charge of the proposed Ellesmere Canal. In 1801 he was appointed by the government to report on improvements of means of communication in Scotland. He was responsible for the construction of the Caledonian Canal, begun 1804, and for more than 900 m. of roads in Scotland and for more than 100 bridges, as well as improvements of harbours at Wick, Aberdeen, Peterhead, Banff, Leith, etc.



Thomas Telford, British engineer

roads in England, as well as the Carlisle-Glasgow and Shrewsbury-Holyhead roads, with the Menai suspension bridge and the Conway bridge. In 1818 he helped to found the Institute of Civil Engineers, and became its first president. The leading civil engineer of his time, Telford died Sept. 2, 1834, and was buried in Westminster Abbey. *See* Caledonian Canal; Menai Bridge; *consult also* Life by himself, 1838; *Lives of Engineers*, S. Smiles, new ed. 1905; *The Story of Telford: the Rise of Civil Engineering*, Sir A. Gibb, 1935.

Teli. Indian caste of oilmen. Numbering some 4 million, mostly in Central and N. India, one-seventh are Mahomedan, six-sevenths Hindu. Only 7 p.c. of the caste are now engaged in oil-pressing; the remainder have turned to other callings.

Telissu OR WA-FANG-KOU, BATTLE OF. Fought between the Russians and the Japanese, June 15, 1904. This battle was the result of the first attempt of the Russians to relieve Port Arthur from the N. On May 30 the Japanese cavalry came in touch with the Russian horsemen, and from this date

until June 5 there were constant cavalry skirmishes in which the Japanese had the advantage.

Stackelberg's first instructions were not to fight a decisive action against superior forces, and he therefore selected a defensive position S. of Wa-fang-kou, on a line running through Telissu, and across the valley of the Fuchou river, which divided the position in two parts. On June 15 Oku attacked and crushed the weakened Russian right, and the Russians were badly defeated and forced to retreat with a loss of 3,500 men and a considerable number of guns. The Japanese losses were less than 1,200.

Tell, WILLIAM. Legendary national hero of Switzerland. He is first mentioned in a ballad and a chronicle, both probably written about 1470, and from these and other sources a narrative was compiled, which is still popularly accepted as historical. It relates that Gessler, the tyrannical bailiff of the duke of Austria, ordered those who passed to salute the duke's hat set up in Altdorf. Refusing to do so, Tell, a peasant of Uri, was sentenced to execution unless he could with an arrow shoot an apple placed on his young son's head. This he did.

Taken as prisoner in a boat with Gessler and his men, he leapt ashore during a storm, and from an ambush shot the tyrant in the "hollow lane" at Küssnacht. Tell then led a rising, resulting in Swiss independence. These events are dated 1307. It has been shown that the story is largely mythical, and that it is in the main a form of the very widespread folk-tale of the hero archer. Schiller's great

work on this subject is *William Tell*. The story is largely mythical, and that it is in the main a form of the very widespread folk-tale of the hero archer. Schiller's great



William Tell. Memorial statue, by R. Kissling, erected at Altdorf in 1895

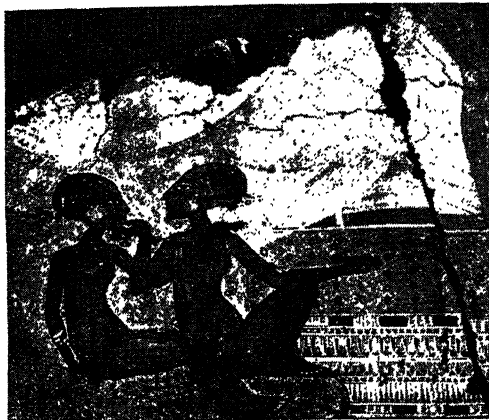
drama, Wilhelm Tell, was written 1804, and Rossini's opera, Guillaume Tell, was produced in 1829.

Tell el-Amarna. Ancient city on the right bank of the Nile, 25 m. upstream from Beni Hasan, Upper Egypt. It was built by the heretical Pharaoh Akhnaton about 1375 B.C. in honour of his new god Aton, the sun's disk. In 1892 Flinders Petrie excavated in Akhnaton's royal residence, Akhetaton, stucco pavements with naturalistic paintings and much pottery. Many rock-hewn tombs preserve vigorous sculptured scenes. About 300 clay tablets in Babylonian cuneiform, from the archives of Amenhotep III and Akhnaton recovered in 1887 and subsequently, include letters from Mesopotamian kings and Syrian governors. The famous head of Nefertiti was found by a German expedition. Exploration was continued during the 1920s and 1930s by the Egypt Exploration society, and large areas of the city and its temples were uncovered. *See Egypt; consult Tell el-Amarna, J. D. S. Pendlebury, 1935.*

Tell el-Yehudiya (Arabic, mound of the Jews). Ruin-mound near Shibin el-Kanatr, midway between Cairo and Zagazig, Lower Egypt. Native diggers from 1870 onwards exposed and dispersed an exquisite alabaster-paved palace of Rameses III, with chambers lined with glazed mosaic tiles. In 1906 Petrie, who excavated the mound, found proofs of Hyksos occupation and also disclosed what may be the temple which Josephus says was built at Leontopolis about 170 B.C. by Onias IV, son of the high priest of Jerusalem, in imitation of Solomon's temple.

Teller of the Exchequer. Former official in the exchequer whose duty was to collect all moneys due to the sovereign. The teller, or tallier, received them, and gave the clerk of the pells (*q.v.*) a bill to charge him with the amount. There were four tellers of the exchequer. The office was abolished in 1834. *See Exchequer.*

Tellicherry. A picturesque Moplah seaport of India. It is in Malabar dist., Madras state, and was the site of the E. India co.'s first factory on the Malabar coast, 1683. In 1781 the co.'s forces beat off an attack by Haider Ali. The frigate *Superb* was lost here in 1783. From the anchorage, a mile from the shore, coconuts, coffee, and spices are sent to Bombay and Colombo. Pop. 27,576.



Tell el-Amarna. Fresco of the Princesses, discovered in the ruins of the palace, probably representing the daughters of Akhnaton at play

Tello OR **TELL-LO.** Arabic name of ruin mounds 8 m. N.E. of Shatra, S. Babylonia. De Sarzec's excavations 1877-1901, continued by G. Cros, revealed the Sumerian city Lagash. The temple of the city-god Ningirsu and several palace buildings yielded many important examples of early art, including votive figures in copper of about 2450 B.C. *See Lagash.*

Tellurium (Lat. *tellus*, earth). One of the non-metallic elements. Its chemical symbol is Te; atomic no. 52; atomic weight 127.61; density, 6.25 gm per c.c.; melting point 452.5° C.; boiling point 1,390° C. It has a spiral chain type structure. Tellurium was first isolated in 1782 by Von Richenstein, and the discovery confirmed in 1798 by Klaproth, who suggested the name. Berzelius in 1832 showed that the element was closely related to sulphur and selenium. Besides occurring native with sulphur, selenium, gold, silver, etc., it is found in combination with metals in the form of tellurides, *e.g.* hessite, Ag_2Te , and tetradymite $Bi_2(TeS)_3$. Main sources are the slimes from the electrolytic purification of copper and lead and certain flue dusts. Production is confined to Canada and the U.S.A.

Separation of tellurium from selenium is accomplished by precipitating the latter from 28 p.c. hydrochloric acid by sulphur dioxide. Tellurium may be obtained from the oxide by reduction with carbon or with sulphur dioxide in dilute acid solution. The element forms compounds analogous to those of sulphur and selenium. Diethyl telluride has been used as an anti-knock agent, and other compounds in

artificial rubber and as a dark finish for electroplating silver. The presence of tellurium in steel and non-ferrous alloys improves machinability and ductility, while the addition of only 0.1 p.c. to chemical lead greatly improves resistance to wear and corrosion.

Telpherage (Gr. *tele*, far; *pherein*, to bear). Name given to a form of cableway transportation

in which the supporting trolleys are equipped with their own self-propelling electric motors. The trolley, usually known as the telpher, is supplied with electricity by an auxiliary wire, and may be controlled by an operator at certain points or by automatic switches. The term is more widely used for any form of ropeway transmission. *See Ropeway.*

Telugu. Agglutinative speech of the Dravidian family. The typical Andhra language, often called the Italian of India, it is spoken by some 23,000,000, mostly in N. Madras and Hyderabad, and by a few settlers in Ceylon. Its poetical literature, traceable back to the 9th century, has greatly influenced the colloquial language, which is taught at the London school of oriental studies. The Telugu-speaking peoples, of Tamil type, but taller and fairer, are energetic cultivators and seamen.

Tembuland. One of the Transkeian Territories of Cape Province, South Africa. It was formally proclaimed British territory in Nov., 1881, and annexed to Cape Colony in 1885. The country, in addition to Tembuland proper, comprises Bomvanaland and Emigrant Tembuland, and has a pop. of 27,680 Kaffirs and 5,292 Europeans. *See Transkei Territories.*

Teme. River of Wales and England. It rises on the borders of Radnor and Montgomery and flows S.E. to join the Severn 1½ m. S. of Worcester, after a course of 60 m. Its main affluents come from the Long Mynd, Wenlock Edge, and Clec Hills.

Téméraire. British warship. The first and most famous to bear the name was a wooden vessel carrying 98 guns captured from the

French at the battle of the Nile. Under Harvey she fought at Trafalgar. Her record won for her the name of the Fighting Téméraire, and she was immortalised by Turner's picture, now in the National Gallery, showing her being tugged to her last berth. This was exhibited at the Academy in 1839, the year after she was broken up.

Temes or **Timis**. River of Central Europe, in the Banát. It rises in Rumania, in the Carpathians, and flows N., N.W., and W. round the heights of the E. Banát, passing Lugos, and then flows S.W. across the S. of that portion of the Banát which is in Yugoslavia, past Pančevo (Pancsova) to join the Danube, 6 m. E. of Belgrade, after a course of 250 m. Timisoara (Temesvar) lies a little N. of the W. end of the great bend of the river.

Temesvar. Hungarian name of the capital of the Banát, in this work called Timisoara.

Temme, EDWARD HARRY (b. 1904). British swimmer. A native of West Ham and a London insurance clerk, he became an international water-polo player, representing Great Britain at the Olympic Games in 1928.



E. H. Temme,
British swimmer

Trained by T. W. Burgess (*q.v.*), he swam the English Channel from Cap Gris Nez to Dover, Aug. 5, 1927, in 14 hrs. 29 mins. After several attempts, by swimming from Dover to Cap Gris Nez, Aug. 18, 1934, he became the first person to swim the Channel in both directions, his time from England to France, 15 hrs. 54 mins., the fastest that way until 1948. Temme, who also swam the Bristol Channel, used the trudgeon stroke throughout. Later he became superintendent in turn of Nottingham, Hampstead, and Newport, Mon., baths. He trained Tom Blower, who broke his record in 1948. *Pron.* Temmy.

Temora. Township of New South Wales, Australia. It is 296 m. by rly. S. of Sydney, and is a trading centre for the goldfields and for the sheep-rearing district near by. Pop. 4,230.

Tempē (Gr., cuttings). Name of a valley in Thessaly, ancient Greece. Lying between Mts. Olympus and Ossa, about 6 m. long, and watered by the river Peneus, it was celebrated for its wild and romantic scenery. Associated with the wor-

ship of Apollo, it was one of the most important and most easily defensible passes of northern Greece. Its modern name is Lykostomo, wolf's mouth. Tempē was used by the Romans for any delightful valley.

Tempelhof. One of the 20 bors. of Berlin. Situated in the centre of the city, it has what was until the Second Great War one of the largest civil aerodromes in Europe. This was taken over by the Luftwaffe as a fighter base for the air defence of the city. Tempelhof and its airport were captured by the Russians on April 27, 1945. Under the Allied arrangements for dividing Berlin into sectors of occupation, it was part of the U.S. sector of the city, and was used during the Allied air transport of supplies into their sectors when the Russians closed surface routes in 1948.

Tempera (Ital., distemper). In painting, strictly, a medium of a glutinous nature such as yolk of egg, with which pigments can be mixed; by extension, the mixture itself. Tempera is one of the oldest forms of painting, and was the favourite medium for wall decoration until the introduction of fresco.

Temperament. Name applied to methods of tuning the constituent notes of a musical system. That in universal use is termed equal temperament, devised when the necessity for unfettered modulation arising from the development of the European system of music, caused the abandonment of the earlier mean-tone temperament, which, for practical purposes, would require the octave to be divided into more than twelve parts. The trouble arises from the incommensurability of the intervals of the fifth and the octave. If twelve fifths and seven octaves from C are tuned upwards in just intonation, we reach a B sharp in one case and a C in the other, which although regarded enharmonically as the same note, differ from each other by about an eighth of a tone, the vibrations being as 80 to 81.

Equal temperament consists in distributing this difference over all the twelve semitones of the octave, so that every interval, except the octave, is slightly out of tune. The fifths are a trifle flat, and the fourths correspondingly sharp. The result is that the seconds, thirds, sixths, and sevenths, are decidedly out of tune, though not enough to be offensive. Modulation of every kind thus becomes feasible, which

was not so with the mean-tone system, as with this it was impossible to use more than the major keys of E flat, B flat, F, C, G, D, and A and the minor keys of G, D, and A. The farther C major was left behind, the less could inflected notes be used enharmonically, *e.g.* E flat could not be used as D sharp. This difficulty was somewhat clumsily dealt with by means of divided keys, the two portions respectively giving the required enharmonics. *See* Harmony.

Temperance (Lat. *temperantia*). Literally moderation in anything. The word is specially used for temperance in the use of alcoholic liquors. The so-called temperance movement began in the U.S.A. and Great Britain in the 18th century and was first organized early in the 19th. Its pioneers sought to promote a temperate use of malt liquors, and abstinence from distilled spirits; next the suppression of all kinds of intoxicating drink. It has had three platforms, social, religious, and physiological, and from approaching the individual with arguments founded on Christian service or self-interest, it has proceeded to influence the law in favour of compulsory total abstinence for the benefit of the community as a whole, achieving notable victories in the U.S.A., where prohibition was nationwide 1919-33, and was maintained in several states. Scotland has "dry" areas by local option.

Among prominent temperance advocates have been Dr. Benjamin Rush, Lyman Beecher, Joseph Livesey, Father Mathew, Cardinal Manning, Sir Wilfrid Lawson, both archbishops Temple, Dean Farrar, Sir Victor Horsley, Frances Willard, Lady Henry Somerset, W. E. Johnson, Lord and Lady Astor, Dr. C. C. Weeks, Dr. C. W. Saleeby, Lord and Lady Snowden.

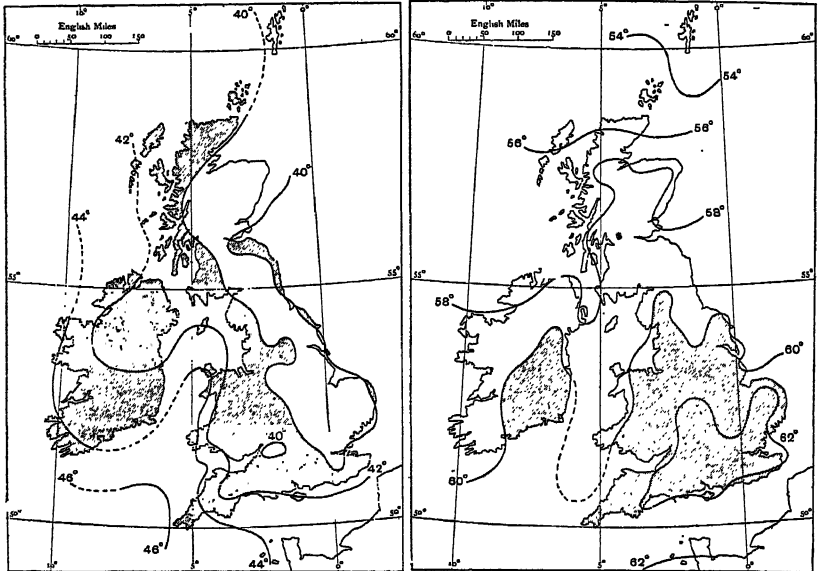
The movement became vital in the U.S.A. with the founding of the American temperance society at Boston, 1820; in the U.K. with that of the British and Foreign temperance society in London, 1831. The first world's temperance convention was held in London in 1846. After the Christian churches took up the campaign, societies and leagues sprang up in all directions; Bands of Hope were formed to interest the children, similar bodies to influence women; friendly and provident societies were founded on a temperance basis; temperance hospitals were started, the first in London in 1873; attention was devoted to the subject in the

British parliament and other legislative bodies, by medical men and by insurance societies; and it received marked impetus from the missions of Moody and Sankey and the Salvation Army, which from the start made total abstinence a condition of membership. The introduction of unfermented wine at Holy Communion was a revival of the practice of the Abstemii of the time of Calvin and Luther.

Among temperance organizations in Great Britain are the British Temperance League; U.K. Alliance for the Legal Suppression of the Liquor Traffic; U.K. Band of Hope Union; National Temperance League; and the orders of Good Templars, Rechabites, and Sons of Temperance. See Band of Hope; Gothenburg System; Licensing Laws; Local Option; Prohibition.

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Temperature (Lat. *temperatura*). Condition which determines the flow of heat from one substance to another. It is essential to distinguish between temperature and heat, e.g. if a thin strip of platinum and another of copper are held for 10 secs. in the flame of a gas jet and then withdrawn, the copper strip will feel considerably hotter to the touch; both must have reached the same temp., viz. the state of hotness of the flame, but the copper has acquired more heat than the platinum. Again, the amounts of heat required to raise the temp. of a lb. of iron, a



Temperature. Maps showing, left, mean temperatures over the British Isles reduced to sea level for the month of January, taking an average from the years 1906 to 1935, and, right, for the month of July as averaged over the same period. The shaded areas have mean temperatures above 40° F. for January, and above 60° F. for July

From "Climate of the British Isles," E. G. Bilham (Macmillan)

gall. of water, and a cub. ft. of air from 60° to 70° C. differ, although the temp. changes are identical. Whenever two bodies are in thermal communication, there is an interchange of heat; should this result in a net gain to the one and a loss to the other, the temp. of the former is said to have been lower than that of the latter. On the other hand, if there is no net gain or loss by either, the bodies are said to be at the same temp.

Heat is conceived to be a form of motion; the heat which a body contains is the total energy of its atoms or molecules, the temp. being proportional to the average kinetic energy of one of these molecules. If we therefore imagine two bodies of the same material (hence whose molecules have the same mass) to be brought into contact, heat will then pass from the body whose molecules are moving faster to the one whose molecules are moving more slowly; the body which is the larger, i.e. possessing more molecules, will contain the greater heat. It is not possible to determine average molecular energy directly, but it is fairly easy to express temp. change as a change in some resultant effect. Generally, the rise of temp. of a body is accompanied by e.g. expansion of the body, increase in its electrical resistance, change in its electro-motive force. Any device for measuring temp. in this way is termed a thermometer, but

such scales of temp. are purely arbitrary since equal steps on a particular scale do not necessarily correspond to equal changes in the average molecular energy.

If heat is applied steadily to a solid, there is a gradual rise in temp. until the melting point is reached; the temp. then remains at this level until melting is complete, after which there is again a rise to the boiling point temp.; when the liquid is completely vaporised a further rise in the temp. of the gas may be brought about by continued heating. The freezing and boiling points of water under standard conditions (i.e. under a pressure of 760 mm. of mercury at sea level in lat. 45°) on the Centigrade scale are designated 0° C. and 100° C. and on the Fahrenheit scale 32° F. and 212° F. respectively. Sulphur melts at 112.8° C. and boils at 444.6° C.

Temp. is of vital importance to living things, and of all the meteorological elements its influence upon human distribution is the greatest. Waterless deserts can be rendered habitable by irrigation, but artificial heat and clothing are often inadequate to overcome hardship due to the low temps. of climates which do not permit vegetation. Winds, rainfall, cloudiness, etc., are dependent, either directly or indirectly, upon temp. The atmosphere owes its temp. almost entirely to the sun, which is continually radiating energy into

space. All of this solar energy does not reach the earth's surface; part is absorbed by the atmosphere, part is scattered by the molecules of air and tiny particles of dust—most of this eventually reaches the earth—and part is reflected back from the upper surfaces of clouds. Further reflection of the rays takes place from land, water, and, particularly, snow and ice surfaces. Of the half or more of the sun's heat which is neither absorbed by the air nor reflected, part is used up in evaporating water. The lower layers of the atmosphere are heated or cooled by the transference of heat by conduction, convection, and radiation from the surfaces on which they rest.

Atmospheric temp. decreases with alt. at a rate of approx. 5.5° C. per kilometre (.621 m.) up to the lower limit of the stratosphere, i.e., c. 7 m. on the average. There is, generally, very little change of temp. with height in the stratosphere. Observations, chiefly of sound waves refracted back to earth, indicate that from c. 15 m. to 30 m. higher the temp. again rises steadily, and reaches a maximum exceeding that at ground level. At greater heights the vertical distribution of temp. is more uncertain, but it appears that before the Heaviside or "E" region is reached (i.e., c. 65 m.) there is once again a fall to stratospheric temps., followed by another rise. After the Second Great War direct measurements of temp. made in the U.S.A. with German V-2 rockets, assigned the value of 60° C. to air at an alt. of 75 m.

The temperature of a place is usually measured by thermometers exposed about 4 ft. or so above the ground in special screens or shelters; it depends, directly, upon the sun's altitude and the duration of sunlight, and, indirectly, upon the warming of the air by heat transferred by winds. The hottest regions of the earth are not on the equator, which to some extent is screened by cloud, but the trade wind deserts, e.g. the Sahara, where in summer months the skies are continuously clear. The lowest temps. occur in winter in the interior of great land masses, e.g. N.E. Siberia, where nocturnal radiation is strong and lakes of cold air form. Temps. in these warm and cold areas have ranged from about 100° F. above to 125° F. below freezing point.

Land and sea distribution has a marked effect upon temp., the interior of a continent being subject to extremes of heat and cold, while

MEAN TEMPERATURES NORTH TO SOUTH POLES

Lat.	Jan.	July	Year
90° N ..	-42 ..	30 ..	-9
80 ..	-26 ..	36 ..	-1
70 ..	-15 ..	45 ..	13
60 ..	3 ..	57 ..	30
50 ..	19 ..	65 ..	43
40 ..	41 ..	75 ..	57
30 ..	58 ..	81 ..	69
20 ..	71 ..	82 ..	77
10 ..	78 ..	80 ..	80
0 ..	79 ..	78 ..	79
10 ..	79 ..	75 ..	77
20 ..	78 ..	68 ..	73
30 ..	71 ..	59 ..	62
40 ..	60 ..	48 ..	53
50 ..	47 ..	38 ..	42
60 ..	36 ..	16 ..	26
70 ..	26 ..	-9 ..	7
80 ..	13 ..	-39 ..	-17
90° S ..	8 ..	-54 ..	-28

the oceans and the adjacent land areas enjoy more equable conditions. Temps. also depend upon the direction and character of the prevailing winds since air moving over the surface of the earth tends to carry with it the temperature of its place of origin, modified by its subsequent passage. Winds blowing from sea to land tend to ameliorate the climate, whereas winds from land to sea carry extreme conditions with them. The great ocean currents also play an important rôle, warm currents warming the winds, cool currents cooling them. Elevation is a principal factor in determining the temp. of a place; as a rule there is a decrease of approx. 1° F. for every 300 ft. increase in height. Snow- and ice-covered surfaces are efficient reflectors of solar radiation and radiators of terrestrial radiation; consequently the temp. of such surfaces sinks to very low levels, and even if there is sufficient heat to bring about melting, the temp. cannot rise above the freezing point as long as the snow or ice remains. Frozen seas behave in the same way as land surfaces. Local factors such as the slope of the ground and the nature of the soil also have their effects.

The isothermal maps accompanying this article indicate that in the British Isles summer temps. differ only slightly from those of corresponding latitudes. In Jan., however, the air over Scotland is, on the average, 25-35° F. warmer than the lat. warrants, with the result that the W. coast of Great Britain has virtually the same temp. from N. to S. The winter warmth of Great Britain is due to the autumnal and winter clouds which blanket the earth and pre-

vent the loss of heat, the relative warmth of the surrounding seas due to the surface drifts of warm oceanic water from the S.W., and the prevalent warm, moist, westerly winds. See Atmosphere; Boiling Point; Climate; Heat; Isotherm; Meteorology; Thermometer; consult also Climate of the British Isles, E. G. Bilham, 1938; Climate, W. G. Kendrew, 1938; The Oxford Advanced Atlas, J. Bartholomew, 1942; Climatology, B. Haurwitz and J. M. Austin, 1944.

A. J. Drummond, F.R.Met.S.

Temperature. In medicine, the temperature of the body may afford valuable help in the diagnosis of disease. In health the human bodily temp. is about 98.4° F., but varies slightly during the day, being most often rather higher in the evening than in the early morning. The temp. taken in the mouth or rectum is slightly higher than that taken in the armpit. A temp. below normal may occur in conditions of collapse following peritonitis, typhoid, cholera, and other fevers, poisoning by certain substances, and some injuries to the brain. An increase of temperature occurs in many forms of acute illness, as well as in acute fevers. Temps. as high as 112° F. have been observed in cases of tetanus and sunstroke; high temp. may be the result of the action of toxins on the heat-regulating centres of the brain.

Tempering. Metallurgical process of treating steel by heat. It follows hardening by quenching, and involves reheating the hardened steel to a certain temperature in order to remove internal stresses and to toughen it. Hardened steel has a hard, brittle constituent, martensite, which is iron supersaturated with carbon, and is usually internally stressed by the severity of quenching. On reheating to some temperature below 700° C., the internal stresses are relieved, and the martensite decomposes, carbon being precipitated as fine particles of cementite. These particles are dispersed throughout a matrix of a soft constituent, ferrite, and this tempered martensite structure imparts the best combination of strength and toughness. Where hardness and strength are the most desirable properties, as in tool steels, tempering is at about 200°-300° C., but where shock resistance is of supreme importance, the figure is 600°-700° C.

Temperley, HAROLD WILLIAM VAZELLE (1879-1939). British historian, born April 20, 1879. From Sherborne school he went to

King's College, Cambridge and then to Peterhouse. After holding a fellowship at the latter college for 34 years he was elected its master, being also university professor of modern history, in which capacities he died, July 11, 1939. Editor of the *Cambridge Historical Journal*, 1922-37, and several



H. W. V. Temperley,
British historian

times president of the international historical congress, Temperley was the leading British authority on the Near East. During 1917-21 he served at Salonica, went on missions to the Yugoslavs, and helped to draw the Albanian frontier. His big work on the foreign policy of Canning was published in 1925. He was joint editor with G. P. Gooch of British documents in 11 vols. on the origins of the First Great War; projected a series of studies on England and the Near East, of which *Crimea* came out first in 1936; and wrote with A. J. Grant a text-book on Europe in the 19th and 20th centuries, new ed. 1938. Radio dramas of contemporary history were produced by Temperley with Laurence Gilliam.

Tempest, THE. Last of Shakespeare's plays, a romantic comedy written about 1610-11. Prospero, duke of Milan, as the result of a conspiracy by his brother Antonio, and Alonso, king of Naples, has been exiled with Miranda, his daughter, on a desert island. By the agency of Prospero's servant-spirit Ariel, the conspirators, with Alonso's son Ferdinand, are wrecked on the same island. Miranda and Ferdinand fall in love, Prospero consents to their union, forgives his brother and the king, abandons the magic to which he has devoted his time, and resumes his dukedom. An underplot concerns an unsuccessful conspiracy by Caliban, Prospero's monster slave, and the Neapolitans Stephano and Trinculo, to murder Prospero.

First printed in 1623, *The Tempest* seems to have been suggested by narratives of the wreck of Sir G. Somers in the Bermudas in 1610, and also indebted to Italian and German sources. In the soliloquies of Prospero, some commentators have found a suggestion that Shakespeare was taking leave of the stage. These passages and Ariel's songs touch his highest

poetic level. The play is short, 2,068 lines, including 458 in prose and 1,458 in blank verse. In a notable revival at His Majesty's, 1904, Tree played Caliban, and his daughter Viola was Ariel. John Gielgud was a fine Prospero, at the Old Vic, 1930 and 1940, and Ion Swinley acted the part at the Open-Air Theatre.

Tempest, DAME MARIE (1866-1942). British actress. Mary Susan Etherington was born in London, July 15, 1866; educated in Belgium; studied singing under Manuel Garcia at the R.A.M., and first appeared on the London stage in Suppé's *Boccaccio* at the Comedy Theatre, May 30, 1885. During the 1890s she was brilliant in musical comedy at Daly's, e.g. *The Geisha*, *A Greek Slave*, and *San Toy*. At the height of her popularity she abandoned this style to appear as Nell Gwynn in *English Nell*, 1900. In such roguish parts she quickly became perhaps the most sparkling comedienne of her time. In Mrs. Dot, 1908, she created a type of character to which she long adhered. She was excellent in *Hay Fever*, 1926; *Mr. Pim Passes By*, 1928; *The First Mrs. Fraser*, 1929; *Theatre Royal*, 1934; *Dear Octopus*, 1938. Her jubilee as an actress was celebrated in 1935 by a performance at Drury Lane, when the proceeds were devoted to building a ward for members of her profession at St. George's Hospital. Marie Tempest was created D.B.E. in 1937. Her husband, Cosmo Gordon-Lennox (d. 1921), wrote some of her most successful plays; later she married W. Grahame Browne (d. 1937). She died Oct. 14, 1942.



Marie Tempest,
British actress

Templars. Name by which the knights of the order of the Temple are sometimes known. See *Knights Templars*.

Template or **TEMPLET** (Lat. *templum*, small timber). Pattern made of wood or sheet metal to show the outline size of a thing, the position of bolt-holes, rivet-holes, etc.

In masonry, templates are slabs of hard stone set in a wall to take the ends of a beam or girder, and so to distribute the stress over a greater area. In shipbuilding, the two wedges in a keel block which are knocked away when the block

is to be removed are called templates. In certain types of patchwork, a template of card or metal is used to ensure similarity in size and shape of patches.

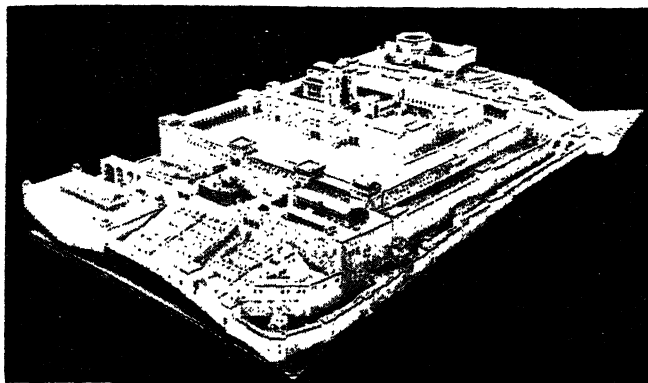
Temple (Lat. *templum*). Building dedicated to the worship of a god or goddess. The first *templum* of the ancient Romans was simply the space of earth and sky marked off by an augur for divination.

Egyptian temples were built by degrees over a long period, each new king adding to the original plan by building new courts in front of old ones, or converting courts into covered halls, until a vast area was covered by the sacred building. Permanence was ensured by the use of solid materials. Temples in Mesopotamia were constructed of unburnt bricks. In Egypt, the temple dominated all other buildings, in Mesopotamia it was subsidiary to the palace.

The Hindu temples of India resemble those of the Egyptians in regard to successive growth, though their style is widely different, the peculiar religious ideals of the Indians finding expression in luxuriant and involved ornamentation rather than in rational principles of construction. Many are cut out of solid rock. The pagoda form is well illustrated at Madura. Buddhist temples in China and Japan are generally of two storeys. The actual sanctuary is enclosed by a sort of cloister, and there are pagodas in the outer enclosure.

The Greek temple affords the most conspicuous examples of Greek architecture. Roman temples are mostly governed by Etruscan and Hellenistic influences. The circular temple, illustrated by the Pantheon and the Temple of Vesta in Rome, is a very ancient Italian type, to which the Romans clung for a long time. Roman temples as a rule rise on a high platform, with a flight of steps, and surrounded by a rectangular enclosure. See *Architecture*; Baalbek; Babylon, plate; Borobudur; Buddhism; Cave Temple; Elephanta; Ellora; Greek Art; Kandy; Karnak; Mandalay; Pantheon; Parthenon; Peiping; Petra; Pola; Pompeii; Poona; Teocalli; Ziggurat.

Temple. In Hebrew history, the building at Jerusalem, the only authorised sanctuary of Jehovah. The site, occupied by three temples in succession, was on the E. ridge, sometimes called Moriah, separated from the main part of the city by the Tyropoeon valley. The existing area, called the Haram, is formed by enormous



Temple. Reconstruction of the temple built by Herod at Jerusalem, from the south-east. From the model by C. Schick

retaining walls, partly the work of Herod, and perhaps also of Solomon. Solomon's temple, described in 1 Kings 6, 7, appears to have belonged to the Phoenician type, with certain Egyptian and Aegean features. Destroyed by Nebuchadrezzar, 586 B.C., it was rebuilt by Zerubbabel, encouraged by Haggai and Zechariah, 520-516 B.C.

Herod the Great, who had in 37 B.C. carried the temple by assault, began 20 B.C. to rebuild it on a magnificent scale. The area, doubled in size, and 26 acres in extent, was surrounded by a lofty colonnade, triple on the S. side. It was burnt by the Romans, A.D. 70.

Temple. Group of buildings formerly standing in Paris, originally the headquarters of the Order of Knights Templars. Here Louis XVI, his sister Elizabeth, his wife Marie Antoinette, his daughter, and his son, Louis the dauphin, were confined on Aug. 13, 1792. The dauphin, called Louis XVII (*q.v.*), was kept a prisoner in the Temple until Jan. 19, 1794, under the care of a cobbler, Antoine Simon, and his wife. It was announced that he had died on June 8, 1795, but rumours that he had escaped were never definitely disproved.

Temple, EARL. British title held by the family of Temple since 1749. In the 14th century the Temples were seated at Temple Hall, Leics. A younger branch settled in Bucks, where about 1590 John Temple bought the estate of Stowe. His son Thomas was made a baronet in 1611, and from him the earls are descended.

The title was first bestowed upon Hester, daughter of Sir Richard Temple of Stowe. She married Richard Grenville, who died early, and their son was Richard Grenville Temple (1711-79), first earl.

In 1756 he became first lord of the Admiralty by the influence of his brother-in-law, the elder Pitt; and he



1st Earl Temple, British politician

was lord privy seal 1757-61. George Grenville (*q.v.*) was his younger brother. On Richard's death the earldom passed to his nephew, George Grenville-Temple-Nugent. Twice lieutenant of Ireland, he was made marquess of Buckingham, and was the father of the first duke of Buckingham and Chandos. The latter in 1822 was created Earl Temple of Stowe, with remainder to his granddaughter Anna, who married W. H. P. Gore-Langton. On the death of the 3rd duke of Buckingham in 1889, the original Temple earldom became extinct, and the new one passed to W. S. Gore-Langton. In 1940 Chandos Grenville Temple-Gore-Langton (b. July 13, 1909) became 6th earl.

Temple, DOROTHY, LADY. This English letter-writer who married Sir William Temple is better known by her maiden name, Dorothy Osborne (*q.v.*).

Temple, FREDERICK (1821-1902). British prelate. He was born at Santa Maura, or Leucadia, Ionian Islands, Nov. 30, 1821, second son of the lieutenant-governor of Sierra Leone, and was educated at Blundell's and Balliol College, Oxford, of which he became fellow and



Frederick Temple, British prelate

lecturer. Ordained 1846, he was examiner to the board of education, 1848-49; principal of Kneller Hall, 1849-55; inspector of men's training colleges, 1855-57; for 12 years headmaster of Rugby; bishop of Exeter from 1869 until in 1885 translated to London; and archbishop of Canterbury, 1896-1902. He died at Lambeth, Dec. 23, 1902, and was buried at Canterbury.

Temple was perhaps the greatest schoolmaster after Thomas Arnold. His contribution on *The Education of the World to Essays and Reviews*, 1856, aroused a storm of criticism from those who doubted his orthodoxy. His other publications were *Sermons Preached in Rugby School Chapel*, 1861-71; and the *Bampton lectures on Relations between Religion and Science* 1884. *Consult* Life, W. F. Aitken, 1903.

Temple, SHIRLEY JANE (b. 1928). American film actress. Born at Santa Monica, Calif., April 23, 1928, she first appeared on the screen at three, and a full-length film, *Red-Haired Alibi*, 1933, established her as an infant prodigy. In a succession of films over the next three years—*Stand Up and Cheer*, *Baby Takes a Bow*, *Bright Eyes*, *Our Little Girl*—she sang, danced,



Shirley Temple, American film actress, as she appeared in her early films

and acted with such extreme naturalness that there was no bigger box-office draw in the U.S.A. or Great Britain. *Rebecca of Sunnybrook Farm*, 1938, was her last important picture as a little girl, but she developed into an ingénue, playing in *Fort Apache*, 1948.

Temple, SIR WILLIAM (1628-99). English diplomatist and essayist. Eldest son of Sir John Temple (1600-77), master of the rolls in Ireland, he was born in London and educated at Emmanuel College, Cambridge. After a period of foreign travel, he married in 1655 Dorothy Osborne (*q.v.*). Having represented Carlow in the Irish parliament since 1660, he began his diplomatic career in 1665. In 1668 he effected the Triple Alliance



Sir William Temple, English diplomatist

between England, Holland, and Sweden; and in 1677 brought about the marriage of William of Orange and Mary. He several times refused a state secretaryship, and spent the latter part of his life at Moor Park, Surrey, where Swift was his secretary. He died Jan. 27, 1699, and was buried in Westminster Abbey. A brilliant diplomatist, Temple wrote memoirs, letters, verse, and essays, easy and graceful in their style. *Consult Works*, 4 vols., 1814; *Memoirs*, T. P. Courtenay, 1836; *Letters of Dorothy Osborne*, ed. E. A. Parry, 1888; *Sir William Temple*, C. Marburg, 1932.

Temple, WILLIAM (1881-1944). British prelate. Born at Exeter Palace, Oct. 15, 1881, he was the second son of Frederick



William Temple,
British prelate

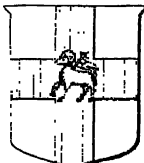
Temple, bishop of Exeter and later archbishop of Canterbury. William went to Rugby and Balliol, and at Oxford a brilliant career led to a lectureship in philosophy at Queen's College, 1904-10. He did not take holy orders until he was 27. He became chaplain to the archbishop of Canterbury (R. T. Davidson), 1910; headmaster of Repton, 1910-14; and held the rectory of S. James's, Piccadilly, during the First Great War. Chaplain to the king and canon of Westminster, he received in 1921 the bishopric of Manchester. Archbishop of York from 1929, he succeeded Lang at Canterbury in 1942.

Temple was one of the outstanding English archbishops. A man in whom great gifts went side by side with humility, of abounding vitality and singleness of purpose, he aimed at a revitalised Church and breathed something of his own fervour into its activities. His social conscience was sensitive, and injustice aroused in him righteous anger. The man who had been president of the Workers' Educational Association, 1908-24, was not so much an orthodox Socialist as one who believed that the profit motive must be harnessed to the idea of social service. Speaking on this and kindred subjects, he could fill the Albert Hall; but at the height of his influence, on Oct. 26, 1944, he died suddenly.

He had published *Plato and Christianity*, 1916; *Personal Religion and the Life of Fellowship*,

1926; *Christianity and the State*, 1928; *Thoughts on Some Problems of the Day*, 1931; *Nature, Man, and God*, 1934. His *Life and Letters* were the subject of a book by F. A. Iremonger, 1948.

Temple, INNER AND MIDDLE. District of London. It lies between W. Fleet Street and E. Strand and



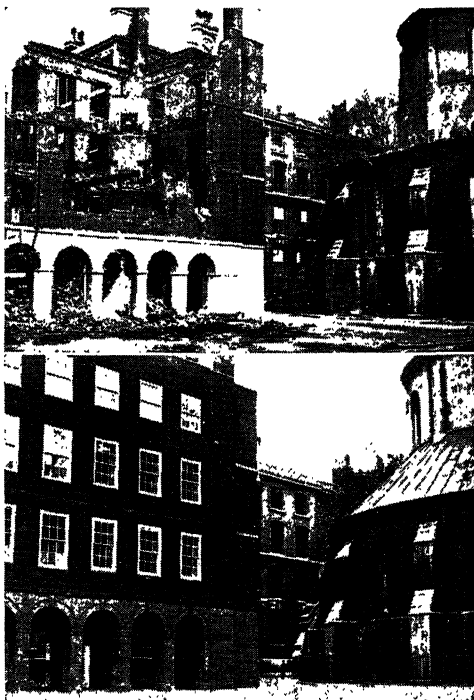
Temple. Arms of, left, the Inner; right, the Middle, Temple

the Thames. The property, 1184-1313, of the Knights Templars (*q.v.*), then of the Knights of S. John of Jerusalem (*q.v.*), from 1608 it belonged to the two inns of court named after it, who jointly maintained the church.

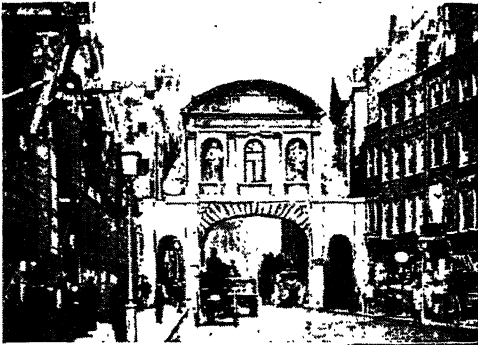
The E. or Inner Temple portion is marked by the device of a winged horse; the W. or Middle Temple by the lamb and flag. Each society is independent, and both date from the 15th century. In 1668-69 and 1678-79, the City made unsuccessful attempts to assert authority over the precincts. The ancient privileges included the right to hold a court leet and the right of sanctuary. Much damage was done by fire in 1666, 1677, 1678, and 1941. The gate-house in Fleet Street of the Inner Temple dates from 1610-11; Inner Temple Hall, built by Smirke in 1866, was completely destroyed in an air-raid, May 10-11, 1941. Middle Temple gate-house was repaired in the time of Henry VIII; Middle Temple Hall was built 1562-72, and stone-faced 1757, the entrance tower being added in 1832. Damaged by incendiary bombs 1941, it was restored and reopened in 1949. In Middle Temple

gardens, Shakespeare (Henry VI, part 1) places the incident leading to the Wars of the Roses. Middle Temple library, opened in 1861, was declared a dangerous structure in 1944, as the result of a nearby bomb explosion. The precinct is redolent of literary as well as legal memories. *See Inns of Court. Consult The Temple*, H.H.L. Bellot, 1914; *The Ravages of the War in The Inner Temple*, Sir F. MacKinnon, 1945.

Temple Bar. W. boundary, at the N. side of the Temple, of the City of London liberties. The spot has been marked since 1880 by Temple Bar memorial. The 13th cent. bar or chain was superseded in 1533 by a stone gateway, which, damaged by the Great Fire, was replaced in 1670-72 by another, built by Wren. This was removed, 1878-79, and put up again in 1888 by Sir H. B. Meux at Theobald's Park, near Waltham Cross. Wren's gate was adorned with statues of Charles I and II, James I, and Anne of Denmark; heads of felons and traitors were until about 1772 displayed on iron spikes projecting from the top; and over the central arch was a room, once occupied by Pynson the printer. At Temple Bar, on a royal visit to the City,



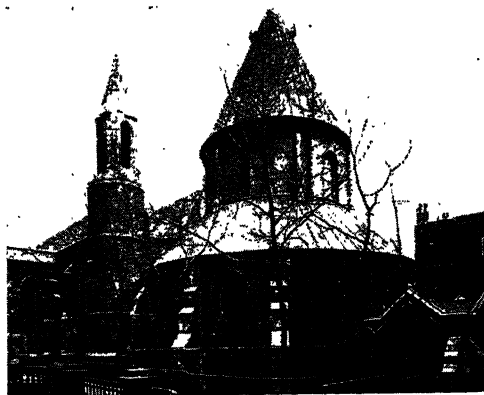
Temple, London. The Cloisters, with the Temple Church, bottom picture, as they appeared before the Second Great War. Top, the same corner after the severe air raids which greatly damaged the Temple as a whole in 1941



has been observed since early times the custom of the lord mayor presenting the civic sword to the sovereign, by whom it is returned. See Griffin; Pillory.

Temple Church, THE. Church belonging to the Inner and Middle Temple inns of court, London. One of the four round churches in England, the others being Cambridge, Northampton, and Little Maplestead, Essex, it was erected by the Knights Templars (*q.v.*), dedicated to S. Mary, and consecrated in 1185 by the patriarch of Jerusalem, its form being that of the Holy Sepulchre.

The Round is of transition Norman work; the choir, Early English, was added in 1240, its S. half being allocated to the Inner, and the N. to the Middle Temple; raised seats in the aisles

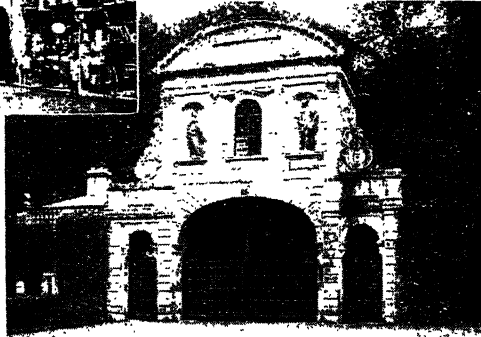


Temple Church, London. The original round church, from the north-west, as it was before the Second Great War, during which it was severely damaged in an air raid

were reserved for benchers. The entrance to the church is a fine porch. Restorations were carried out by Smirke in 1839-42 James Howell, John Selden, and Edward Thurlow were buried here. Goldsmith's grave is in the churchyard N. of the choir. Remains of the chapel of S. Ann on the S. side were removed in 1825. The church.

which was noted for its musical services, is exempt from episcopal jurisdiction; its masters (preachers) have included Richard Hooker and Alfred Inger. The organ built

came later to the Meynell Ingrams. From them it was inherited by the Hon. E. Lindley Wood, afterwards 1st earl of Halifax, who sold the estate in 1921 to the corporation of Leeds. The house, which is now used as an art gallery and museum, and the extensive grounds form one of the chief amenities of that city, with which Temple Newsam is



Temple Bar. The old London gate as it was erected in Theobald's Park, Hertfordshire. Top, left, the Bar before its removal in 1878, seen from the Strand

late in the 17th century was destroyed by fire during the air raid of May 10-11, 1941, as were the recumbent marble figures of Templars dating from the 12th-13th cents., which the church contained; the structure of the church was reduced to a shell and the master's house, which dated from after the Great Fire, was destroyed. See

Temple. Consult The Temple Church, T. H. Baylis, 1893; The Church of the Knights Templars in London, G. Worley, 1907.

Templemore. Urban dist. and market town of Tipperary, Eire. The centre of an agricultural area, it stands on the Suir, 11 m. S. of Roscrea, with a rly. station. The town was founded by the Knights Templars, of whose castle only

a gateway remains. Market day, Wed. Pop. est. 2,300.

Temple Newsam. Estate of Yorkshire (W.R.), England. It is 3½ m. from the centre of Leeds. The name is due to the fact that here, in 1181, the Knights Templars built one of their houses. After the suppression of the order, the estate passed to the family of D'Arcy and

connected by tram and bus. Temple Newsam is thought to be the original of Templestowe in Scott's Ivanhoe.

Templewood, SAMUEL JOHN GURNEY HOARE, 1st VISCOUNT (b. 1880). English politician and diplomatist. He was born Nov. 24, 1880, and educated at Harrow and New College, Oxford. He entered politics

in 1905, becoming assistant private secretary to A. Lyttleton, then colonial secretary, and in 1910 was elected Conservative M.P. for Chelsea, a seat he held until raised to the peerage in 1944. During

1922-24 and from Nov. 1924 to 1929 he was Air minister, and Indian secretary during 1931-35. Foreign minister in 1935, he was forced to resign by the



Lord Templewood, English politician

hostile criticism aroused by the Hoare-Laval Pact (*q.v.*). Returning to the govt. as Home secretary in 1937, he again became Air minister in 1940, but was sent to Spain as ambassador in the same year and stayed in that post until 1944. His efforts to keep Franco Spain out of the war were described in his book *Ambassador on Special Mission*, 1946. In 1937 he made the first civilian flight to India, described in *A Flying Visit*, published the same year. He was well-known as an athlete, having represented Oxford at tennis and rackets, and being a first-rate skater.

Tempo (Ital., time). Term relating to the pace of music, and not to time (*q.v.*) in the technical sense. It is usually indicated by Italian words which have now gained a cosmopolitan meaning

These words are sometimes exact in signification, *e.g. Lento*, slow; *Presto*, quick; sometimes they are indicative of character, *e.g. Allegro*, gay; *Andante*, going. They can be modified by the addition of other words such as *più*, more; *meno*, less; *molto*, much; *poco*, little; and by terminations such as the superlative form of an adjective (*Prestissimo*), or a diminutive (*Allegretto*).

Temporal Power. Term applied to the civil authority formerly exercised by the pope. With the removal of the seat of the Roman empire to Constantinople the authority of the bishops of Rome became largely territorial; but the actual origin of the temporal power dates from the victorious struggle with the Iconoclast emperors in the 8th and 9th centuries. Thenceforward the popes ruled over the greater part of central Italy with unquestioned authority until the end of the 18th century, when Napoleon incorporated the papal provinces in the Cisalpine republic. On the downfall of the empire the popes resumed their temporal dominion, which was, however, curtailed to the city of Rome itself in 1859. Their last foothold was lost in 1870 with the capture of Rome by the Italians. *See* Papacy.

Temps, LE. Former French daily newspaper. Established in Paris, April 24, 1861, by Auguste Nefftzer (1820-76), a native of Alsace, it soon became widely known as an exponent of moderate political views. In 1867 it came under the control of the Hébrard family, who continued in ownership for many years. It was the most influential organ of the French press, and its outstanding achievement was to win over the French bourgeoisie to republican institutions. Among its many famous contributors were André Tardieu (foreign editor, 1902-14), Ernest Lavisse, Sainte-Beuve, Renan, George Sand, and Francisque Sarcey, perhaps its most famous theatrical critic. After the liberation of Paris in 1944 *Le Temps* was closed down, like all other papers which had continued to appear during the Nazi occupation; but its place was taken by *Le Monde*.

An earlier *Le Temps*, founded by Jacques Coste, was published during 1829-42, and had Guizot among its contributors.

Temptation (Lat. *tendere*, to stretch). Condition of being tempted or persuaded, usually to evil. The term is applied specifically to the experience of Jesus Christ in

the wilderness when, after fasting 40 days and nights, the devil appeared to Him (Matt. 4), and to the appearance of the serpent to Eve (Gen. 3).

Temuco. City of Chile and capital of the rich agricultural prov. of Cautin. It lies 430 m. S. of Santiago. Apples, barley, oats, timber, and wheat are the principal products of the dist. It is the h.q. of the S. American Missionary Society. Pop. 84,696.

Ten, COUNCIL OF. Supreme tribunal of the former Venetian Republic. It originated after the rising of 1310, when Bajamonte Tiepolo headed the popular outcry against the despotic closing of the grand council. Tiepolo's rising was suppressed and a council of ten members of the patrician class was hastily summoned to investigate the causes of the revolt, and punish those concerned. In 1335 the council was made permanent, and, thereafter, until the overthrow of the republic in 1797, it governed the city, sometimes assisted in emergencies by a giunta of 20. The council had supreme power and authority to examine and determine all political, criminal, and domestic affairs, and, though its methods were secret and often tyrannical, it ruled the republic justly, and saved it from foreign aggression. The council consisted of the doge and ten annually elected members. *See* Venice.

Tenacity (Lat. *tenēre*, to hold). State or condition of holding fast. The term is used in physics for the greatest stress a substance can bear without breaking. This is usually estimated in tons per sq. in. Different metals have different tenacity values, varying from 1 for lead to 100 for certain kinds of steel. *See* Engineering; Strain and Stress.

Tenant. In English law, one who holds, *i.e.* possesses property of which another is the owner. In theory, no one in England is the owner of land. He always holds of someone; and, if of no one else, of the king. This is part of the feudal law. Thus we speak of a tenant in fee simple, a tenant in fee tail, a tenant for life, a tenant for years, a tenant from year to year, a weekly tenant, and the like. In a more limited sense, a tenant is one who holds for a definite period, subject sometimes to notice to quit, at a rent. A service tenant is one who holds a tenement as part of his contract of service, and as part of his remuneration, *e.g.* a gardener whose employer provides

him with a cottage. *See* Land; Landlord; Rent Restriction.

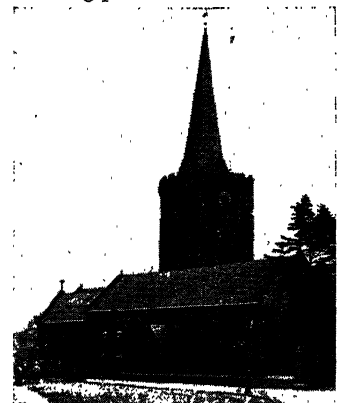
Tenant-right. In England, a custom whereby an outgoing agricultural tenant can recover from his landlord compensation for some labour expended, or improvement effected by the tenant in the holding, of which, by reason of the termination of the tenancy, he has not reaped the full benefit. *See* Agricultural Holdings Acts.

Tenasserim. River of Burma. It rises in the Tenasserim coastal range, flows N., and then curves round to flow S. to enter the Bay of Bengal round the S. end of the range in the neighbourhood of Mergui. Its length is 200 m.

Tenasserim. A division of Burma. It occupies the S.E. of the prov., and includes the long narrow extension E. of the Gulf of Martaban, and the lower Salween Valley. The rainfall is exceptionally heavy, varying from 200 ins. in the centre to 150 ins. in the N. and S. Rice is the chief crop. Except in the Amherst and Thaton dist. the land is almost entirely incapable of cultivation. Tin is mined in parts. The chief towns are Moulmein, Mergui, and Amherst. Tenasserim, which became British in 1826, covers 35,886 sq. m. Pop. 2,110,420.

Tenbury or TENBURY WELLS. Market town of Worcestershire, England. It is 22 m. N.W. of Worcester on a branch rly., in a corner of the co., and on the river Tem, which here forms the boundary with Shropshire. There are pump and bath rooms for the medicinal springs which yield water beneficial to gouty and rheumatic complaints. Near by is the church and college of S. Michael, built in 1856. Market day, Tues. Pop. 1,755.

Tenby. Mun. bor., seaport, and watering-place of Pembrokeshire,



Tenby, Pembrokeshire. Parish church of S. Mary, from the N.W.

Wales. With a station on the main rly. it is $9\frac{1}{2}$ m. E. of Pembroke, on Carmarthen Bay. Formerly a busy port, it now depends on its increasing popularity as a seaside resort. The town walls, repaired by Henry VIII, are mostly existing, while in the ruined castle the keep, built by the Flemings, is almost intact. The parish church of S. Mary was restored in 1885. There was a Flemish colony of weavers in Tenby in the 12th century. Market days, Wed. and Sat. Pop. 4,108.

Tench (*Tinca vulgaris*). Fresh-water fish of the carp family. It is native to Europe, including Great



Tench. European fresh-water fish about 18 ins. long

Britain, and parts of Asia Minor. Attaining a length of about 18 ins. with a weight between 3 lb. and 4 lb., its upper parts are coloured a rich olive, which pales to a light grey beneath; but the coloration varies considerably with surroundings. The reddish-brown or violet fins are all rounded, the scales very small, and the fleshy lips have a small barbule at each angle. The fish is thickly coated with mucus. It inhabits still waters, preferably those with deep muddy bottoms, in which it can hibernate, and on which in summer it prefers to lie lazily. It feeds on water-weeds and the snails and insects found among them. Carefully cooked the tench is a palatable food.

Tenchebrai, BATTLE OF. Fought between Henry I of England and his brother, Robert, duke of Normandy, Sept. 28, 1106. Henry had invaded Normandy and the rival armies met outside the town of Tenchebrai. The English king dismounted his knights and arranged them in a solid mass, and although the Norman cavalry had an initial success, Henry's phalanx drove the rival infantry in utter rout before it. The results of the battle were important; Robert was taken prisoner and Normandy came under Henry's rule. The town, called in modern times Tinchebrai, lies 13 m. N.N.W. of Domfront, in the dept. of Orne, on the road and rly. between Flers and Granville, and is specially interested in making hardware.

Tencin, CLAUDINE ALEXANDRINE GUÉRIN DE (1681-1749). French novelist. She was born at

Grenoble, and having failed to find a vocation in a religious community, was released from her vows and in 1714 went to Paris. There she established a salon and led a brilliant but irregular life, Cardinal Dubois and possibly the regent Orléans being among her numerous lovers. She died Dec. 4, 1749. She wrote several romances, notably *Mémoires du Comte des Comminges*, 1735, and *Le Siège de Calais*, 1739. *Mémoires Secrètes de Madame de Tencin*, and her correspondence with her brother, were published in 1790. Consult *Madame de Tencin*, P. Masson, 1909.



Claudine de Tencin, French novelist After Des Neiges

Ten Commandments, THE. Term used for the Decalogue, or code of ten laws given through Moses to the children of Israel. They formed part of the Jewish law and were adopted by the Christian Church. See Decalogue.

Tende, COL DE (Ital. Col di Tenda). Alpine pass in S.E. France. It separates the Maritime from the Ligurian Alps. A carriage road traversing a tunnel 2 m. long at an alt. of 4,300 ft. connects Nice with Cuneo; there is also a 5 m. long rly. tunnel at 3,400 ft. Formerly Italian, the area in which the Col de Tende lies was surrendered to France in the peace treaty of 1947.

Tender (Lat. *tendere*, to stretch out). In English law, an offer to pay a debt. To constitute a legal tender, the debtor must actually produce the exact sum and offer to pay it then and there. It must be made in legal coinage. (See Legal Tender.) The word is also used for an offer made to supply goods or services, with an estimate of prices to be charged, to a firm or council in response to an "invitation to tender."

Tender (shortened from attendant, attendant on). Vehicle coupled to the rear of a locomotive engine. Part of the tender is constructed as a water tank for replenishing the boiler, and the rest of the space may form either a bunker for carrying coal or wood fuel, or a tank for oil fuel. A small vessel which conveys passengers, mails, or supplies to or from a larger vessel is also called a tender. See Locomotive.

Tendon. Fibrous cord which connects the fleshy part of a muscle with the bone into which the muscle is inserted. Rupture of a tendon is most frequently the result of violent strain.

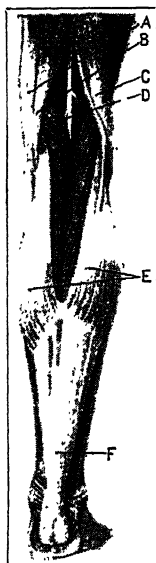
The tendon of Achilles is a stout tendon forming the lower part of the gastrocnemius muscle. It passes down the leg and is inserted into the back of the heel. The name perpetuates the legend that it was the place where Achilles was vulnerable, because he had been held by the heel when dipped in the water of immortality.

Tendrill. In botany, a twining thread-like organ by means of which certain plants cling to a support. It is extremely sensitive, and when it rubs against the rough surface of a suitable support, twines many times round it. In some plants it is a modification of the whole leaf; in others, one or more leaflets of a compound leaf are modified; in the white bryony, vine, and other plants it is a modified side-shoot. See Climbing Plant.

Tenebrae (Lat., darkness). Name given in the R.C. liturgy to the office of matins and lauds of the three last days of Holy Week (q.v.). Originally said in the early hours of the morning, the combined office is now said or sung on the evenings of the Wed., Maundy Thursday, and Good Friday.

Tenebrae for each day consists of 16 psalms with their antiphons, together with certain lessons and responsories dealing with the Passion; the name being taken from the responsory after the fifth lesson on Good Friday, beginning, *Tenebrae factae sunt dum crucifixerunt Jesum Judaei* (There was darkness while the Jews crucified Jesus).

While the psalms are being sung all save the topmost of the fifteen tandles in the triangular candlestick are extinguished one by one; during the chanting of the Bene-

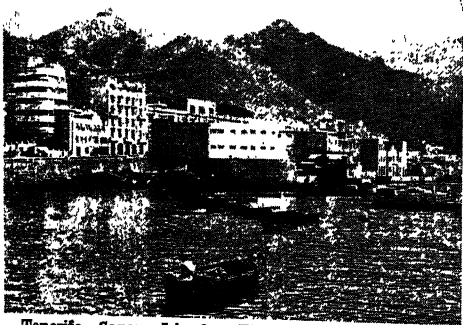


Tendon. Diagram of tendons at back of leg. A. Semitendinosus. B. Semimembranosus. C. Biceps. D. Tibial nerve. E. Gastrocnemius. F. Tendon of Achilles

dictus the six altar candles are put out; and at its conclusion the remaining light from the candlestick is hidden under the epistle side of the altar. After the Pater Noster and Miserere have been said in darkness, a clapping or rattling noise is made to represent the confusion of Nature at the death of its Author, and the lighted candle is then produced as a symbol of the Resurrection.

Tenedos. Turkish island in the Aegean Sea off the W. coast of Asia Minor. It played a considerable part in Trojan times. It exports wines and raisins. About 6 m. long and 2 m. broad, its area is 16 sq. m. and its pop. some 5,000. Formerly belonging to Turkey, it passed to Greece under the treaty of Sévres, 1920, but was returned to Turkey in 1923, though with the proviso that it should be demilitarised.

Tenerife OR TENERIFFE. Chief island of a maritime prov. of Spain of the same name, and the largest of the Canary Islands. It is of volcanic origin and is crowned by the famous Peak of Tenerife, El Pico de Teyde, 12,185 ft. alt., with a crater 300 ft. in diameter and 70 ft. deep. The Peak may be seen more than 100 m. away and forms a valuable landmark for navigators. The top is snow-clad in winter. Dates, coconuts, cotton, grain, sugar, bananas, and grapes are the chief products of the island. Its area is 782 sq. m. Pop. 401,283. The chief town and seaport is Santa Cruz de Tenerife, cap. of the prov. Pop. 79,928.



Tenerife, Canary Islands. The town and seaport of Santa Cruz de Tenerife, capital of the province

Tengri Nor. Lake of Tibet. It stands at an alt. of over 15,000 ft. 80 m. N.W. of Lhasa, and is about 50 m. long.

Tengyueh. Walled town on the W. border of Yunnan prov., China, situated at an alt. of 5,360 ft., on the Namti, a tributary of the Taiping river. It was opened as a



David Teniers the Younger. Portrait of Himself in an Inn, a painting characteristic of this Flemish artist's style

treaty port in 1902. Captured by the Japanese advancing from Burma during the Second Great War, Tengyueh was recaptured Aug. 4, 1944, by the American trained and equipped Chinese 2nd army advancing from the Salween (*g.v.*) river. Pop. 21,861.

Teniers. Name of a family of Flemish artists. The first to attain distinction was David Teniers the elder (1582-1649). He studied under Rubens and passed most of his life in Antwerp. The National Gallery, London, and other European galleries contain examples of his work.

David's son, David Teniers the younger (1610-90), was born in Antwerp, Dec. 15, 1610. He studied under his father and became painter to the court of the Hapsburgs at Brussels, giving lessons to Don John of Austria. Nearly 1,000 of his works are known to exist; mostly small genre paintings, they are found in many public and private collections. They show the life of the

peasantry, especially their pleasures, and bear witness to the influence of Rubens. A notable example is *The Village Fête*, in the National Gallery, London. Teniers, who married Anna, daughter of Jan Brueghel (*g.v.*), founded the academy at Brussels in 1663. He died at Brussels,

April 25, 1690. He had a son David who also became a painter.

Tenison, THOMAS (1636-1715). English prelate. Born at Cottenham, Cambs, Sept. 29, 1636, he



Thomas Tenison, English prelate

was educated at Norwich and Corpus Christi, Cambridge. Ordained in 1659, he held livings in Cambridge and at Norwich—S. Peter Mancroft—and in London—S. Martin-in-the-Fields. In 1691, having secured by his actions and by his Protestant zeal during the reign of James II the favour of William III, he was made bishop of Lincoln. He delivered the funeral sermon on Mary II, and in 1695 became archbishop of Canterbury, taking an active part in affairs of state until his death, Dec. 14, 1715.

When at S. Martin-in-the-Fields, Tenison built and endowed a school for boys and established a public library, the first in London. From 1871 the school was in Leicester Square until in 1928 it was moved to a new building near the Oval at Kennington. The old premises were bombed in the Second Great War.

Tennant, SIR CHARLES (1823-1906). British merchant. Born at Glasgow, Nov. 4, 1823, he was educated there, and in 1846 joined his father as partner in the family chemical works at St. Rollox. Tennant also secured interests in explosive, mining, and other companies. As a Liberal he represented Glasgow and Peebles and Selkirk

in parliament, 1878-86, and in 1885 was made a baronet. He died June 4, 1906, leaving over £3,000,000 to his three sons. The eldest was made Lord Glenconner (1859-1920), and the youngest, Harold John (1865-1935), was secretary for Scotland, 1916. One of Sir Charles's daughters, Margot, became the countess of Oxford and Asquith (*q.v.*).

Tennantite. In mineralogy, one of the grey copper ores, sulphide of copper and arsenic, often contains some antimony and grading towards tetrahedrite (*q.v.*). Tennantite occurs in association with other minerals of copper.

Tenné OR ORANGE (Old Fr., tawny). In heraldry, one of the little-used colours. It is represented in drawing by lines from sinister chief to dexter base, crossed by vertical lines.

Tennessee. River of the U.S.A. Formed by the union of the French Broad and Holston rivers above Knoxville, it flows S.W. through Tennessee into Alabama, re-enters Tennessee, following a generally N. course through that state, and finally traverses Kentucky to join the Ohio at Paducah. Including the Holston it has a total length of about 1,200 m. It is fed by a soaking rainfall—84 ins. a yr. in some places. Even before the Tennessee Valley Authority (*v.i.*) began construction, the federal govt. had spent up to 1927 about £10,000,000 on improving navigation of the Tennessee and its tribs. By 1933 the income per head in the valley had sunk to 40 p.c. of the national average, so much had erosion and flood of "America's worst river" reduced the output of the farms.

Tennessee. East central state of the U.S.A. It has an area of 42,246 sq. m. The surface ranges from the Great Smoky and Unaka Mts. in the E., along the border with N. Carolina, through tablelands and basins to bluffs of the Mississippi, which flows along the W. border, separating the state from Arkansas and Missouri. Here is the major portion of 41,000 sq. m. of the Tennessee River Valley, scene of the great experiment conducted by Tennessee Valley Authority (*v.i.*). Other river systems are those of the Mississippi and Cumberland. Alts. range from Clingman's Dome, 6,643 ft., in the Great Smoky Mts., to 182 ft. on the Mississippi. Agriculture is the predominant industry; crops include maize, oats, hay, potatoes, and peanuts. Some 30,000 sq. m. of forest yield valu-

able hardwood. The state ranks seventh in output of cotton and fifth among tobacco producers. Minerals include coal, lead, zinc, and marble, and there is a high yield of aluminium, copper, pyrites, and sulphuric acid.

Largest cities are Memphis, Nashville (the capital), Chattanooga, and Knoxville, the last an administrative centre of T.V.A. At Oak Ridge, 18 m. N.W. of Knoxville, was one of the towns built to accommodate workers on the first atomic bomb. There are six universities, including Tennessee, Vanderbilt, and Fisk (for negroes), and the George Peabody college for training teachers. Two senators and 10 representatives are returned to congress. Pop. 2,915,841.

First visited by de Soto in 1541, Tennessee was successively claimed by Spanish, French, and English, but the first permanent settlement was not made until 1757, when it was part of N. Carolina. It was ceded to the U.S.A. in 1790 as part of the territory S. of the Ohio, and joined the Union six years later. The nickname of Volunteer State dates from its record in supplying troops for the Mexican Wars. Except Virginia, it was the principal battleground of the Civil War, and the first confederate state to be re-admitted to the Union. The original Ku-Klux-Klan (*q.v.*) was formed at Pulaski, 1865. The history of Tennessee was written by P. M. Hamer, 1933.

Tennessee Valley Authority. American government planning agency. One of the world's boldest as well as largest ventures in regional reconstruction and state planning, it was created by an act of congress in 1933. Its operations affect seven states (Tenn., Va., Ky., Ala., Ga., N.C., and Miss.). The authority owns 26 immense dams on the Tennessee River and its tribs., by which destructive floods are prevented, seasonal fluctuations levelled off, a 650-m. channel kept suitable for ships of 9 ft. draught, and hydro-electric power developed. Norris Dam, on the Clinch, is the chief of these. By 1947, T.V.A. power, distributed by 92 municipalities and counties, was being used by 743,000 customers. In connexion with the scheme 150 million trees were planted. There are soil clinics and demonstration farms, and experiments are carried out in chemical, agricultural, and biological research laboratories; one result being the wiping out of malaria, another the arrest of soil erosion,

in areas covered by the authority. By 1948 T.V.A. had spent about \$750 million (£185 m.), raised the income level of 3½ m. people by 75 p.c., and created 9,000 miles of shore open to recreation along new lakes. T.V.A. power fed the plant at Oak Ridge, Tenn., which in 1941 secretly began the production of the atomic bomb.

Tenniel, Sir John (1820-1914). British pictorial artist and cartoonist. He studied at the R.A. schools, and was cultivating the severest form of high art when in 1850 he was invited to fill the vacancy left by Doyle on Punch. In 1862 he began to supply a weekly political cartoon regularly, and continued this work till he retired in 1901. Although deprived early, through a fencing accident, of the sight of one eye, Tenniel was a meticulous draughtsman, fertile in invention and restrained, while always effective, in his humour. Many of his cartoons became famous, e.g. his record of the dismissal of Bismarck by William II, entitled Dropping the Pilot; but few of his Punch drawings made so permanent an impression on the public mind as his illustrations to Lewis Carroll's Alice's Adventures in Wonderland (*q.v.*), and Through the Looking-Glass, which first introduced the familiar lineaments of such characters as the Mad Hatter and the Duchess. He was knighted in 1893, and died Feb. 25, 1914. See Cartoon. Consult Life, F. Sarzano, 1948.



Sir John Tenniel,
British artist

Tennis OR REAL TENNIS (O.Fr., royal). Game played with a ball and rackets by two or four persons on a walled court divided across the middle by a net. The game was first played with the hand and in the open air. By degrees the racket was developed, chiefly in Italy, and in that country, France, England, and elsewhere courts began to be built for the game. The game began to decline during the 17th and 18th cents.

The oldest court extant is that at Hampton Court Palace, built for Henry VIII in 1530. He and many English and French kings were tennis players. The Versailles court, built in 1686, which is now a museum, will always remain famous as the scene of the Tennis Court Oath (*v.i.*) in the French Revolution.

There is no standard size for a tennis court, which is an oblong building with four walls and roof, but the main dimensions are about as follows—greatest internal length 110 ft., greatest internal breadth 38 ft. 10 ins., length of floor 96 ft., breadth of floor 31 ft., height of side walls in play 24 ft., height of end walls in play 30 ft. The net is 5 ft. high at the sides, and 3 ft. in the centre of the court. Round the outer walls there runs on three sides of the court an inner wall with a sloping roof. This roof, which joins the outer walls at a height of 10 ft. 7 ins., and the inner wall at a height of 7 ft. 2 ins., is known as the penthouse. The remaining outer wall, known as the main wall, is plain, with one buttress known as the tambour. On one side, the service side, is a large opening in the inner end wall known as the dedans, and on the other, the hazard side, is a small opening in the inner end wall known as the grille. In the inner side wall on either side of the net are a number of openings known as galleries. The last opening farthest from the net on the hazard side is the winning gallery. Dedans, grille, and winning gallery all provide winning strokes for the striker on that side of the net opposed to them. The floor of the court is of stone or composition specially treated. The interior of the balls is made of strips of cloth bound tightly together and tied in a certain way. They are covered with the best white cloth. Rackets are made of ash, and weigh 15–17 ozs.

Among famous modern professional players have been George Lambert, champion 1871–1885, and Peter Latham, 1895–1905 and 1907–08. World champion in 1948 was Pierre Etchebaster. Leading British amateurs were J. M. Heathcote, 1859–1884; Alfred Lyttelton, 1884–1896; E. M. Baerlein after the First Great War; Lord Aberdare. The chief English competitions are the amateur championship and the M.C.C. prizes.

The first known rules of the game were written in 1599 by Forbet. Those now in use in England were drawn up and published by Julian Marshall in 1878. English and French laws differ slightly. See *Lawn Tennis*; consult also *Annals of Tennis*, J. Marshall, 1878; *History of Tennis*, E. B. Noel and J. O. M. Clark, 1922.

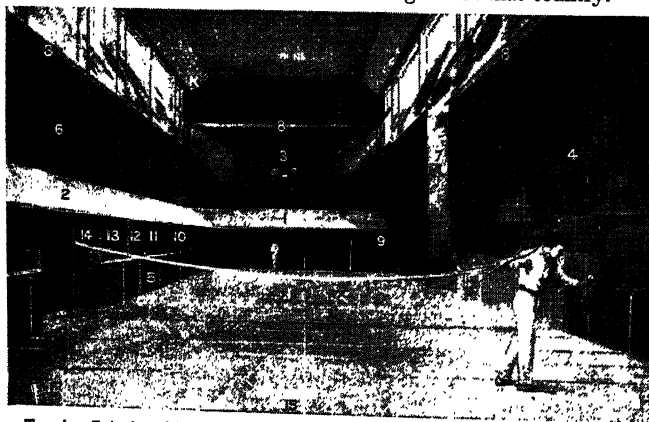
Tennis Court Oath. Episode in the French Revolution. On June 20, 1789, the deputies to the states-general from the third estate, i.e. neither nobles nor clergy, found their debating chamber at Versailles occupied by workmen and a notice announcing that a royal session of all three estates was to be held. Adjourning to a nearby tennis court the deputies, with only one dissident, acclaimed by a solemn oath the proposal of Mounier that they would never separate until they had given France a constitution. This episode is referred to in France as *Jeu de paume* (game with palms, hand tennis), the early name for the game in that country.

Tennyson, ALFRED TENNYSON, 1ST BARON (1809–92). English poet. Born Aug. 6, 1809, at the rectory, Somersby, Lincolnshire, he was the fourth son of the Rev. George Tennyson. During 1816–20 he was a pupil at Louth grammar school. After leaving school he prepared, mainly with the help of his brother Charles, the *Poems by Two Brothers*, published 1827. A year later he entered Trinity College, Cambridge, and there met Arthur Henry Hallam (*q.v.*), son of the historian, whose youthful genius and tragic doom were destined to have an abiding influence on his life and thought.

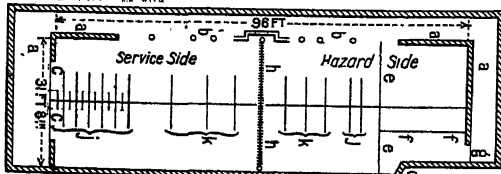
Tennyson made his first real bid for public recognition with *Poems Chiefly Lyrical* in 1830. The critics, with the exception of Blackwood, were favourable, and Tennyson entered definitely upon the poet's career. An onslaught by *The Quarterly* on the volume of 1833, which contained *The Lady of Shalott* and *The Lotus Eaters*, caused him some bitterness; but he recognized the element of truth in the harsh criticism, and sedulously repaired the defects. He now sustained the shock of Hallam's sudden death; and he poured forth his sorrow in that symphony on death and immortality, *In Memoriam*, which years later was to bring him fame. But for nine years his silence was almost unbroken.

In 1842 the famous two-volume edition of Tennyson's poems won general acclaim. There was a haunting melody in his lines, and his pellucid and delicate diction threw an enchanted glow over his descriptions. But with *The Princess*, 1847, he manifested new style and power; it was cast in epic form, and the strain was lofty, yet it failed to satisfy wholly, and suggested a greatness that was yet to ripen.

The year 1850, in which he married and was appointed poet laureate in succession to Wordsworth, saw the publication at first anonymously, of *In Memoriam*. While enshrining the memory of his friend, his genius had fashioned a mausoleum



Tennis. Interior of the Queen's Club, London, tennis court, seen from the service end. 1. End pent-house. 2. Side pent-house. 3. End wall. 4. Main wall. 5. Battery. 6. Side wall. 7. Tambour. 8. Play line. 9. Grille. 10. Last gallery. 11. Second gallery. 12. Door. 13. First gallery. 14. Line opening. 15. Half court line. Right, top, tennis racket; bottom, plan of court. a, passage beneath pent-house; b, galleries; c, dedans; d, tambour; e, service line; f, pass line; g, grille; h, net; i, chaces; k, galleries. The dimensions shown are usual, but there is no standard size.





Lord Tennyson. Left, Somersby Rectory, Lincolnshire, where the poet was born. Right, Aldworth House at Haslemere, Surrey, built in 1868, where much of his later work was written, and where he died, October 6, 1892

Frith

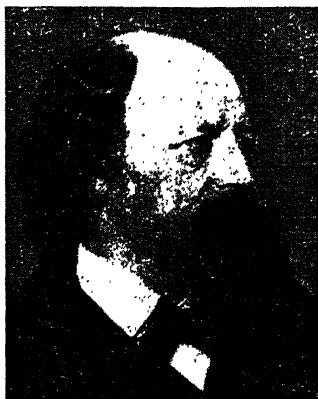
of verse of impressive beauty and worth. During the years of his mourning he had pondered the problem of life and death, had questioned much, hoped, despaired, lost faith in a divine purpose and regained it—and all the moods were expressed in the poem. If there is no clear and emphatic solution of the abiding mystery there is at least in *In Memoriam* a bold examination of the possible clues, and the conclusion leads to the trust, though faint, in the “larger hope.”

Two other works were to crown the poet's career—*Maud*, a poem of passionate love and of war, in 1855, and the prolonged series of *Idylls of the King*, beginning in 1859 and not concluded until 1872. *Maud* shows his lyrical capacity in fullest charm and intensest power; and although the war passages have been sternly reprobated, they have a touch of sublimity. Its theme is the redeeming power of love, and the regeneration which follows the strife of men and the scourges of Nature. But for perfect idealism we turn to the *Idylls of King Arthur*, the dim British hero who shines out in the transcending splendour of romance. The subject had allured Tennyson from his earliest years, and at the maturest period of his life he concentrated his intellectual strength upon it, imparted new glamour to medieval splendours, restored the Table Round, and quickened the inspiration derived from the quest of the Holy Grail.

By the side of this masterpiece the remaining work of Tennyson's last years seems somewhat of an anticlimax. He was amazingly prolific in his old age, and his successive volumes excited interest amounting to enthusiasm. He grew more versatile and fond of experiment. His first drama was published when he was 66; and *Queen Mary*, though doubtfully received, was followed rapidly by *Harold and Becket*, all on the

Elizabethan model; later came *The Falcon*, *The Cup*, *The Promise of May*, and *The Foresters*.

Of greater value were his *Ballads and Poems*, 1880, while the recantation of the frenzied judgements of youth in *Locksley Hall Sixty Years After*, published in 1886, showed that fires still glowed luridly in his heart. Among the swansongs that came from him there was at least one, *Crossing the Bar*, which will be unforgettable. It



Tennyson

served as his dirge when he was laid in Westminster Abbey, Oct. 12, 1892, his death having taken place six days before.

Tennyson's life was uneventful and unromantic. He had consecrated himself to the muse, and kept aloof from the world. Notable friendships were his, and many of them are fitly commemorated; but to most men he appeared remote and cold. The honour in which he was held was attested when he reached his 80th birthday. He had been raised to the peerage five years previously.

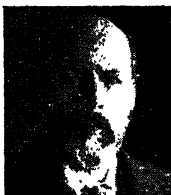
Since his death his place in litera-

ture has been impartially reviewed, not altogether to the advantage of his fame. Student, nature-lover, philosopher as he was, he does not display the strength of Browning or penetrate so deeply as Wordsworth. He expressed obvious or accepted truth with rare felicity, but discovered no new truth. Consequently he holds his place rather as an exquisite phrase-maker than as an original thinker. Belonging to the school of Spenser and Thomson, he delighted in rich words, unerringly chosen; his lines are jewelled; the idea is often thin and superficial. As an idealist, however, he is unexcelled, and, avoiding the rapture and extravagance of Shelley, he makes his ideals possible with all their exaltation.

No poet of the past centuries minted more current coin of speech—his flashing sentences are unexcelled for service. Like his predecessor he uttered nothing base, and he entertained only the noblest conceptions of duty and of the destiny of mankind. Palgrave declared that his work lies somewhere between that of Virgil and Shakespeare, having its portion in the inspiration of both; and, after every requisite allowance has been made, this bold declaration has much to justify it. See *English Literature*; *Idylls of the King*; *In Memoriam*, etc.

The official Life is by his son Hallam (v.i.), 1897, but that by his grandson, Sir C. Tennyson, 1949, contains much new information. Other lives are by S. Gwynne, 1899; A. Lang, 1901; A. C. Lyall, 1902. Consult also *Bibliography of Writings*, T. J. Wise, 1908; *Memories of the Tennysons*, H. D. Rawnsley, 2nd ed. 1912; T.: A *Modern Portrait*, H. I. Fausset, 1923; T.: *Aspects of His Life, Character, and Poetry*, H. Nicolson, 1923; *The Reaction Against Tennyson*, A. C. Bradley, 1923; Tennyson, H. Wolfe, 1930; Tennyson, A. Noyes, 1932; Tennyson: *Introduction and Selection*, W. H. Auden, 1946.

Tennyson, HALLAM TENNYSON, 2ND BARON (1852-1928). English administrator and biographer. The poet's eldest son, he was born Aug. 11, 1852, and acted for some years as his father's secretary. In 1897 he produced an official Life, and also edited the poet's works. During 1899-1902 he was governor of S. Australia, and in 1902-04 gov.-gen. of Australia. Succeeding to the peerage in 1892, he lived until Dec. 2, 1928.



2nd Baron Tennyson,
British administrator

Tennyson, LIONEL HALLAM TENNYSON, 3RD BARON (b. 1889), English cricketer. Born Nov. 7,



3rd Baron Tennyson,
English cricketer

1889, he went to Eton and Trinity College, Cambridge. He played cricket for England against S. Africa in that country, 1913-14; and when the Australians came over in 1921 he led England in four test matches. For several seasons he captained the Hampshire eleven, before and after succeeding to the peerage in 1928.

His cousin, Sir Charles Bruce Locker Tennyson (b. 1879), knighted 1945, was sometime deputy director of the F.B.I. He wrote (1949) a biography of the 1st Lord Tennyson, the poet. Of Sir Charles's sons (Frederick) Penrose (1912-41), film director, married the actress Nova Pilbeam, and died on active service, July 7, 1941; and (Charles) Julian (1915-45), author of *Suffolk Scene*, 1939, was killed in Burma, March 7, 1945.

Tennyson, FREDERICK (1807-98). A British poet. He was born at Louth, June 5, 1807, eldest brother of Alfred Tennyson, and was educated at Eton and Trinity College, Cambridge. His works include *Days and Hours*, 1854; *The Isles of Greece*, 1890; an epic, *Daphne*, 1891; *Poems of the Day and Year*, 1895. He died Feb. 26, 1898. Overshadowed



Frederick Tennyson,
British poet

always by his greater brother, Frederick has scarcely obtained the recognition he deserves.

Tennyson-Turner, CHARLES (1808-79). British poet. Born at Somersby, Lincs, July 4, 1808, an older brother of Alfred Tennyson, he was educated at Trinity College, Cambridge, and became vicar of Grasby, Lincs. He assumed the name of Turner on succeeding to the estate of an uncle. His first literary effort was in the *Poems by Two Brothers*, 1826, by himself and Alfred. Subsequently he devoted himself chiefly to the sonnet, and the volume issued in 1880, *Collected Sonnets Old and New*, contains some pieces displaying great power and beauty. The author had died, April 25, 1879.



O. Tennyson-Turner,
British poet

Tenor (Lat. *tenere*, to hold). Musical term with several connotations. The male voice which lies between the bass and the alto, having moreover its own distinctive quality, is called tenor, because when a lower part was added to the plainsong, the latter was said to be "held" by the higher voice. The viola is sometimes termed the tenor, because in a quartet it takes the part next above the bass. Tenor is also applied to one of the trombones (*g.v.*) and to a military drum. In a peal of bells, the tenor is the lowest in pitch. The tenor clef is the C clef placed on the fourth line of the stave.

Tenorite or **MELACONITE**. In mineralogy, an oxide of copper, CuO, containing nearly 80 p.c. copper. It occurs mostly as a black powder in the zone of weathering of copper veins.

Tenrec (*Centetes*). Genus of small mammals of the order Insectivora. Natives of Madagascar, they are much like hedgehogs in appearance and habits, being sometimes known as the tailless groundhog. They are about 14 ins. in length, brown in colour, and are clothed with a mixed coat of hair and spiny bristles. They have long pointed muzzles and rudimentary tails. Their close affinity with the hedgehogs is shown by the young having lines of short, white spines along the back which are replaced by long, stiff hairs before they become adult. Tenrecs partially roll up when attacked. Their food consists of insects, beetles chiefly; but also includes frogs.

Tense (Old French *tens*; Lat. *tempus*, time). Verbal form which denotes the time of an action or state. The original Indo-European verb possessed three forms which did not indicate the time of an action but the character of it; continuous (present), completed (perfect), momentary (aorist). To express present, past, and future, different tenses were formed: the imperfect for the past of continuous action; pluperfect, the past of completed action; future; the preterite use of the aorist, which originally only denoted momentary action. English has only two simple tense-forms, present and perfect; the loss of the others is made up for by auxiliaries.

Tensile Strength (Lat. *tendere*, to stretch). In physics, stretching or pulling force per unit area of section which has to be applied to a material before it breaks, e.g. the breaking stress of copper is 22×10^8 dynes per sq. cm.

Tension (Lat. *tendere*, to stretch). In mechanics and engineering, a force causing or tending to cause an elongation of a body. A tension member of a bridge or other structure is a member to which a pull or tensile stress is imparted in the direction of its length as distinguished from compressive stress; such a member is said to be in tension. It is also a term used to denote potential difference of an electric current. Electric tension denotes the condition of an electrified body when each molecule repels its neighbour. See *Strain and Stress*.

Tent (Lat. *tendere*, to stretch). Portable shelter used by troops on the march, hunters on the trail, and by nomads as their dwelling. Among primitive people tents are made of skins or woven material sewn together and suspended over a ridge pole. Now they are generally of canvas stretched from

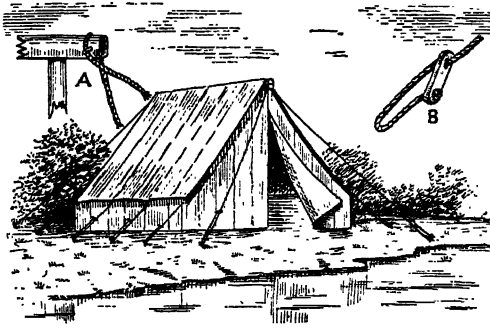


Tenrec. Madagascar mammal resembling the hedgehog

a pole, or over a framework, and are of various shapes and many sizes. Bell tents are hung from a centre pole fixed in the earth, the lower edge being pegged down in a

circle; for square tents the canvas is hung from horizontal bars supported by corner posts on to which a canvas cover is also adjusted. Some large rectangular tents have two or more poles along the centre; marquees, well framed with wooden supports, are made to a very large size, suitable for flower shows, balls, and other entertainments.

Tentacle (Lat. *tentare*, to feel or try). Zoological term to denote



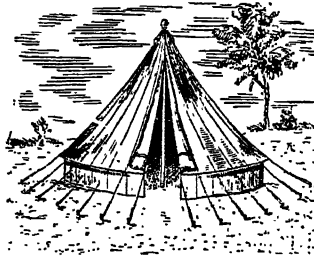
Tent. Square tent, showing, A, method of passing guy ropes over the ridge pole, and, B, runner and loop as attached to tent peg. Top, bell tent, with door opened

thread-like or fleshy processes about the mouths of invertebrates, serving as tactile and food-finding organs. They may be seen in the sea-anemones, zoophytes, jelly-fishes, corals, sea-cucumbers, Polyzoa, cuttles, etc. In most cases when not in use they partially collapse and are folded inwards to protect the mouth opening. See Octopus; Slug; Squid.

Tenterden. Mun. bor. and market town of Kent, England. It is 53 m. by rly. S.E. of London. The 13th-century church of S.



Tenterden, Kent. Tower and porch of the 13th century church of S. Mildred, from the south-east



Mildred has a massive Perpendicular tower. On its N. side is an excludorium, or penitentiary, where Protestant martyrs were imprisoned in Queen Mary's reign. Near by is a house known as S. Benedict's Priory, built 1658. The town is an agricultural centre in the Weald district,

having two annual sheep and cattle fairs, in May and Sept. Tenterden, which belongs to the Cinque Ports, was made a borough in 1449. Associated with Tenterden were Horatia, daughter of Nelson and Lady Hamilton; and Ellen Terry, who lived and died here. Pop. est. 4,150.

Tenterden, CHARLES ABBOTT, 1ST BARON TENTERDEN (1762-1832). English lawyer. Born Oct. 7, 1762, at Canterbury, the son of a hairdresser, he entered the King's School, Canterbury, and won a scholarship at Corpus Christi, Oxford, 1781.

He entered the Middle Temple, 1787, and practised for some years at the bar, being called from the Inner Temple, 1796. He rapidly obtained a large practice, greatly increased on the publication of his work in 1802 on the law relative to merchant ships and seamen, which also enhanced his reputation as an authority on marine and mercantile law. He was appointed a judge, 1816, and lord chief justice, 1818. Made a peer in 1827, he died Nov. 4, 1832.

Tenterfield. Municipality in Clive co., New South Wales, Australia. A road junction on the main

rly. line from Brisbane to Sydney, 11 m. from Wallangarra on the border, it is the centre of a pastoral dist. on the New England Plateau. Pop. est. 3,000.

Tenth. In English history, a tax levied on personal property. It was closely associated with the fifteenth, and under Charles I both were replaced by the subsidy. See Fifteenth; Tithe.

Tenth-Metre. Popular name for the unit of length, 10^{-8} metre, described under Ångström Unit.

Ten Thousand, RETREAT OF THE. Military feat of Xenophon in bringing the Greek army from Sittace in Persia to the Black Sea. See Anabasis.

Tenure (Lat. *tenēre*, to hold). Terms upon which land is held in English law. In English legal theory a person cannot own land outright, but merely holds it as a tenant, i.e. on a tenure. If, however, he is a tenant in fee simple his powers are virtually indistinguishable from those of an owner. The reasons for this are historical. Under the feudal system after the Norman Conquest the king would grant certain lands to his supporters who held as tenants in capite on military tenure—i.e. in return for military services. These tenants might sublet the land or part of it to under-tenants, who might sublet to others also, in return for services. Sub-infeudation, as this was called, was abolished in 1290. There were six kinds of tenure—serjeantry, military service, socage, frankalmoin, and copyhold.

Tenants by serjeantry were required to perform certain services, usually of a personal nature—e.g. preside at the lord's court: tenants by military service were required to provide soldiers; tenants by socage paid a money rent; and tenants by frankalmoin, who were always churchmen, said prayers for the souls of the grantor and his heirs. These five tenures were free—that is, the rights of the tenants were protected in the royal courts. But copyhold tenure was unfree, being granted by some lord of lands within his own manor in return for services (later a money payment) and the rights of the tenant were not recognized in the royal courts, but only in the courts of the lord of the manor. Copyhold tenure depended not on the law of England, but on the custom of the particular manor.

In theory all these tenants held the lands only so long as they performed the services required by the particular form of tenure. It was



1st Baron Tenterden, English lawyer After J. W. Wright

therefore true to say that they did not own the land.

Gradually all these forms of tenure have been abolished or fallen into disuse except socage (now called freehold). A money payment (scutage) was substituted for military service in the 12th century; in 1669 military tenure was abolished and converted into socage, the only other tenure then surviving being copyhold. Under various Acts of parliament copyhold land could be converted into socage, and in 1925 copyhold was abolished. *See* Copyhold; Feudalism; Freehold; Land; Leasehold; Serjeantry; Socage.

Teocalli (Mex., god-house). Pre-Columbian temple-pyramid in Mexico and Central America. Usu-

tion under Dr. E. Speiser in 1931 and subsequent years. Before excavation it was more than 70 ft. high, and the whole accumulation represents almost continuous occupation in the Neolithic, Chalcolithic, and Copper Ages, until the long history of the site came to an end in the early Bronze Age in the middle of the second millennium B.C. By that time the mound had become too high and too small at the top for further building. Its excavation provided unrivalled data concerning the prehistory of northern Assyria. Gawra VI, the city of the sixth stratum below the surface, belongs to the beginning of the Copper Age, i.e. about 2000 B.C., and shows commercial ties as far

was transferred to Germany in 1938, most of its inhabitants then being R.C. Germans. Pop. 45,301.

Ter. River of N.E. Spain, in the prov. of Gerona. It rises on the S. slopes of the Pyrenees, and flows S. and then E. past Gerona, discharging its waters by several mouths into the Mediterranean after a course of about 110 m.

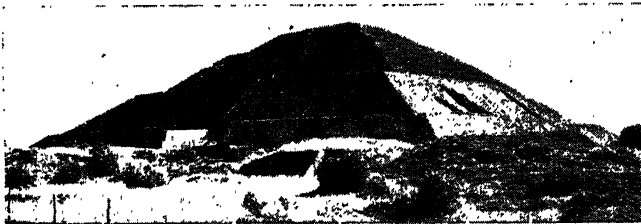
Teramo. Maritime prov. of E. Italy. It is situated in the extreme N. part of the region of Abruzzi e Molise. It is bounded N. by the prov. of Ascoli, S. by Pescara, W. by Aquila, and E. by the Adriatic Sea. Mountainous along the W. border, the surface slopes gradually to the sea. The soil is fertile, well watered, and cultivated, grapes and olives being the chief products. Sheep and cattle thrive on the upland pastures, and the rearing of silk-worms is carried on. Pop. est. 300,000.

Teramo. City of Italy, capital of the prov. of Teramo. It stands on the river Tordino at an alt. of 875 ft., 26 m. N.E. of Aquila and 16 m. by rly. W.S.W. of Giulia Nova on the Adriatic coast and the Ancona-Brindisi line. The cathedral, founded in 1154 and rebuilt about the middle of the 14th century, has been modernised. An interesting edifice is the Gothic church of Sant' Agostino, and there are remains of Roman baths, theatre, gateways, etc. The manufactures include silk, pottery, straw hats, furniture, and leather. Pop. 33,796. Teramo was undamaged during the Second Great War; partisans gained control of it as the Allies advanced, to enter it June 16, 1944, and saved even its bridges.

Terang. Town of Hampden co., Victoria, Australia. It is at the W. end of the Great Valley, 137 m. by rly. W.S.W. of Melbourne, in a fertile farming dist. It is on the main road from Geelong to Warrnambool. Mt. Noorat, in the vicinity, is an extinct volcano. Pop. 2,350.

Teraphim. Hebrew word in the O.T. denoting an image or images. Plural in form and of obscure and varying meaning, it may have signified originally a household god (1 Sam. 19), a head or an image in human guise (Gen. 31), afterwards reduced in size and made of bronze.

Terbium. One of the rare earth chemical elements. Its symbol is Tb, at. no. 65, and at. weight 159.2. It was first discovered by Mosander, who gave the name erbia to its oxide. In 1905 Urbain prepared the first pure specimens of some of its compounds. Ter-



Teocalli. The pebble-built pyramid of the Sun at Teotihuacan, one of the largest examples of pre-Columbian temple-pyramids

ally a solid earth or stone four-sided step-pyramid, a winding ascent or a stairway on each side leading to a temple-crowned platform. The brick-built pyramidal mound of Cholula, near Puebla, 77 ft. high, covering 44 acres, recalls the Mississippi mounds and mound-builders. The five-terraced Aztec pyramid in Mexico City, 375 ft. by 300 ft., was surmounted by shrines of colossal deities. The Teotihuacan pebble-built sun-pyramid, 682 ft. square, was connected by an avenue of mounds with a smaller moon-pyramid. The discovery at this site of a still larger pyramid was announced in 1920. *See* Aztec.

Teotihuacan. Site of an ancient Mexican Aztec city. It is 24 m. S. of Mexico City, the name meaning the abode of the gods. The ruins cover about four sq. m., and the celebrated pyramids of the sun (216 ft. high) and moon (140 ft.) are the largest artificial mounds in the American continent. The sides of the pyramids are terraced, and wide stairs lead to the summits. There are temples of agriculture, the rain god, and the god of air and winds, past which runs the highway of the dead. There are many subterranean halls with coloured decorations.

Tepe Gawra. Mound in N. Iraq, 15 m. N.E. of Mosul, excavated by an American expedi-

tion under Dr. E. Speiser in 1931 and subsequent years. Before excavation it was more than 70 ft. high, and the whole accumulation represents almost continuous occupation in the Neolithic, Chalcolithic, and Copper Ages, until the long history of the site came to an end in the early Bronze Age in the middle of the second millennium B.C. By that time the mound had become too high and too small at the top for further building. Its excavation provided unrivalled data concerning the prehistory of northern Assyria. Gawra VI, the city of the sixth stratum below the surface, belongs to the beginning of the Copper Age, i.e. about 2000 B.C., and shows commercial ties as far

as India, Transcaucasia, and the Cyclades. It provides perhaps the earliest known example of an orderly town-plan and had a central open square and a good drainage system. The houses were of brick on stone foundations. **Tephigram.** Diagram on which can be entered the conditions of the atmosphere at different levels, expressed in terms of its temperature, represented by t , and entropy, represented by ϕ (Greek ϕ); hence the name t - ϕ -gram. *See* Entropy.

Tepec. Town of Mexico. Capital of the state of Nayarit, it stands on a plateau, 3,065 ft. alt., 28 m. E. of the port of San Blas, with which it is connected by rly. It is a health resort, the centre of a region producing gold and silver, and makes cigars and cotton goods. It was founded in 1531 by Nuño de Guzman. Pop. est. 15,000.

Teplíce-Sanov (Ger. Teplitz). Town in the Bohemian portion of the republic of Czechoslovakia. It is 78 m. N.W. of Prague by rly. Its people engage in cotton weaving, printing and dyeing textiles, and making chemicals, rubber goods, and sugar. The hot springs make the town a favourite spa. There are good deposits of lignite in the neighbourhood along the base of the Bohemian ore mts. It was part of the Sudetenland which

bium occurs in the mineral gadolinite, and is best separated from the other members of the group by fractional crystallisation of mixed bromates.

Terborch, GERARD (1617-1681). Dutch painter. Born at Zwolle, he was taught by his father, then



Gerard Terborch. Portrait of a Gentleman, by this Dutch "pocket Velasquez," now in the National Gallery, London

studied at Haarlem under Pieter Molijn, visiting England, 1635, later Italy, returning to his own country, 1641. He afterwards visited Munster, and went to Spain, where he studied under Velasquez. Returning to the Netherlands, he settled at Deventer, of which town he became burgomaster. He died there, Dec. 8, 1681.

With Pieter de Hooch, he is considered the greatest of the Dutch "little masters"; he painted the life around him, in pictures providing valuable information about the customs of his contemporaries whom he observed impartially and portrayed with truth. He used colours sparingly and glazed his canvases by degrees to a substance sufficient to produce a melting impasto. His Guitar Lesson is in the National Gallery, London. Other famous works are at The Hague, Haarlem, and Paris.

Terceira. Island of the Azores group. Lying about 50 m. N.E. of Pico, it is of volcanic origin, the mts. rising some 3,500 ft. in Caldeira de Santa Barbara. The chief products are wine and fruit. The capital is Angra do Heroismo. Area 322 sq. m.

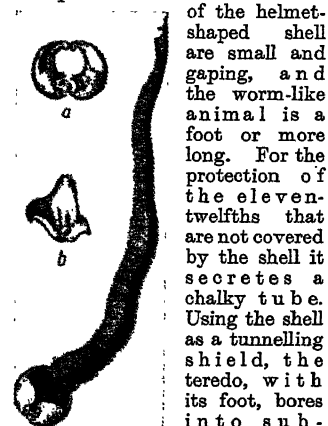
Terebene. Colourless liquid with a pleasant smell resembling thyme and camphor. It is prepared by thoroughly shaking American oil of turpentine with successive quantities of sulphuric acid. The product is then distilled, a yellow

oil known as colophene being left behind in the still. Terebene is used as an inhalation in affections of the throat and lungs. Painters' terebene is a preparation added to paints to promote drying. It consists of manganese and lead soaps dissolved in oil of turpentine.

Terebinth OR **TURPENTINE TREE** (*Pistacia terebinthus*). Small tree of the family Anacardiaceae, a native of the Mediterranean region. Its height is about 30 ft., and the alternate leaves are broken up into two rows of oval-lance-shaped leaflets, which are red when young. The small, greenish flowers are without petals and in large clusters. From incisions in the bark, a resinous fluid is obtained, the Chian or Cyprus turpentine. Horn-shaped galls, useful for dyeing and tanning, are also obtained from this tree. *P. lentiscus* yields mastic, and the fruits of *P. vera* are called pistachio nuts.

Terebratulæ. Genus of brachiopoda popularly known as lampshells from the resemblance of the shells to an antique lamp. See Brachiopoda.

Teredo. Genus of marine bivalve molluscs, popularly known as shipworms. In these the valves



Teredo, its natural size. a, the bivalve shell; b, one valve of shell, showing its three-lobed form

navalis played havoc with the timbers of wooden ships.

The larger *T. norvegica* prefers piers and other stationary timber, whilst *T. megalaria* is seldom found in British waters except on driftwood. A pair of siphons extend through the chalky tube and open into the water. Through one siphon water is inhaled to the gills, and then exhaled through the other, laden with the wood pulp

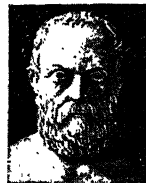
excavated by the foot. The burrow is made merely as a retreat, the mollusc living upon minute organisms brought in through the siphon. By studying the operations of the teredo the elder Brunel perceived how the Thames tunnel might be bored. See Mollusca.



Terebinth. Foliage and flower sprays of the turpentine tree

Terek. River of Caucasus in Daghestan A.S.S.R. Rising in the glaciers of the central heights of the Caucasus, near Mt. Kazbek, it discharges by a delta into the Caspian Sea, after a 400 m. course. The upper Terek valley was the farthest part of Russia reached by the Germans, Nov., 1942, during the Second Great War. See Russo-German Campaigns.

Terence (c. 194-159 B.C.). Roman comic poet, whose full name was Publius Terentius Afer. According to tradition a native of Carthage, he was brought to Rome, where he became the slave of the Senator Publius Terentius Lucanus, who had him well educated and presently set him free, when



Terence, Roman comic poet

he assumed his benefactor's name of Terentius. Devoting himself to translating Greek drama into Latin, in 168 he read his first play, *Andria*, to Caecilius Statius, the most popular playwright of Rome, who at once acclaimed him as a new genius. The play was produced in 166 and its instant success admitted its author into the intimate society of a brilliant literary group, including Caius Laelius, Lucilius, and Polybius. *Andria* was followed by *Hecyra* 165, *Heauton Timorumenos* 163, *Eunuchus* and *Phormio* both in 161, and *Adelphi* 160. After the production of this last play Terence left Rome. He was generally supposed to have died in 159 or 158 B.C. of grief at

the loss at sea of his translations of Menander.

A man of great refinement of mind and artistic skill, gifted with a singular felicity and purity of diction and a delicate humour very different from the broader comic power of Plautus, Terence is a great figure in Roman literature and in the history of the drama, on which his influence can be traced in innumerable later comedies both of life and of manners. There are editions by W. Wagner, 1869, and R. Y. Tyrrell, 1903, and English translations by George Colman, 1765, and by J. Sargeant in the Loeb Classical Library.

Teresa (1515-82). Spanish mystic. Of the noble Castilian family of Cepeda, she was born at Avila, March 28, 1515, and in 1534 entered a Carmelite convent, where she found that the rule of the order was very laxly observed. Experiencing a sudden conversion in 1555, she practised extreme austerities, was habitually entranced during prayer, and saw many visions. Resolved to reform the order, she founded with a few companions a new convent at Avila, dedicated to S. Joseph, in 1562. Bitterly opposed by ecclesiastical authorities at home and abroad, she was befriended by Philip II and other persons of influence, and with S. John of the Cross founded reformed Carmelite convents for men and for women. These were placed under a separate administration approved by the pope in 1580. Teresa de Jesus, as she called herself, died at Alva, Oct. 4, 1582. She was canonised in 1622, and declared patron saint of Spain in 1814.

S. Teresa, one of the greatest women Spain has produced, and one of the chief forces in the counter-Reformation, was a many-sided character, a great Castilian lady, an able organizer, a mystic whose influence has extended far beyond her own Church. She described her own spiritual experiences and life in *The Way of Perfection*, and *The Book of the Foundations*. *The Castle of the Soul* is a widely read manual of mysticism. Teresa was also a devotional poet of some note. *See Carmelites*; *consult also* Life, ed. G. Cunningham-Graham, 2 vols., 1894; Letters, with intro. by Cardinal



Teresa,
Spanish saint
After Rubens

Gasquet, 2 vols., 1920-21; *The Eagle and the Dove*, V. Sackville-West, 1943; *Complete Works*, trans. and ed. E. A. Peers, 1946.

Terlizzi. Town of Italy, in the prov. of Bari. It stands in a fertile plain 7 m. from the Adriatic coast and 18 m. by light rly. W. of Bari. A large trade is carried on in wine and fruit, grapes, almonds, olives, etc., grown in the surrounding dist. Pop. 24,000.

Term (Lat. *terminus*, boundary line). Word used in many cognate senses. In English legal procedure, the legal year was divided into four terms or periods when the courts at Westminster were open. These were: Michaelmas, Nov. 2-25; Hilary, Jan. 11-31; Easter, April 15-May 8; Trinity, May 22-June 12. By the Judicature Act, 1873, terms were abolished so far as the administration of justice was concerned, but not for other purposes. Their place was taken by sittings. At the Inns of Court the old terms are still maintained. School and university years are also divided into terms.

Term of years in English law is a leasehold granted for a fixed number of years, as distinguished from a lease for life or lives. The latter is real property, being a freehold estate; while a term of years is personal estate.

In Scotland the word term is used for a day on which rent or interest is due, the two terms being the Scottish quarter days, May 15 (always called Whitsunday irrespective of the day on which it falls) and Nov. 11 (Martinmas).

In logic, terms are the concepts that form the subject and the predicate of a proposition; there are major, middle, and minor terms of a syllogism. *See* Logic.

Terminal. In art, ornamental finish to a fitting or piece of furniture; sometimes used as a synonym for finial (*q.v.*). A terminal figure is one in which the head and bust spring from a virtually plain block of material, and is of classic origin, representing the Roman god Terminus (*q.v.*).

Terminal Velocity. Velocity of a projectile on impact with its target; also the utmost velocity that a body, such as a bomb released from a great height, can attain. When an artillery projectile is fired from ground to ground, the terminal velocity depends upon the trajectory; the greater the one, the greater the other; but it always exceeds the initial velocity on leaving the muzzle of the gun (*see* Muzzle Velocity). For a bomb dropped by

aircraft, terminal velocity is maximum velocity and is constant for most of the descent. A 200-lb. bomb falling freely will reach the ground at a speed of about 200 ft. per sec.

Terminator. In astronomy, the line, ideally a semi-ellipse, separating the dark portion of the moon's disk from the bright part. It is not a well-defined line, because of irregularities of the moon's surface. The line of cusps, a straight line joining the two ends of the terminator, is always perpendicular to a line drawn from the moon to the sun, so that the cusps or horns are always directed away from the sun.

Termini Imerese. Seaport and spa of Sicily, in the prov. of Palermo. It stands on the N. coast, near the mouth of the San Leonardo river, 23 m. by rly. S.E. of Palermo. It has a cathedral and the Ospedale dei Benfratelli, an edifice housing a museum of antiquarian relics and paintings by Sicilian masters. There are remains of a Roman theatre, basilica, aqueduct, etc., also well-equipped baths for its hot saline springs, which have a temperature of 106° F. The town was founded by the Carthaginians in 407 B.C. Under the name of Thermae Himerenses it became important during Roman occupation owing to its mineral springs. The chief industries are tunny and sardine fishing, and the manufacture of macaroni. Pop. 21,200.

Terminos, LAGUNA DE. Inlet of the Gulf of Mexico, in the Mexican state of Campeche. It is almost entirely cut off from the sea by a number of islands, the largest of which is Carmen. It is 70 m. long and 40 m. broad, and lies at the N.W. end of the isthmus of Yucatan.

Terminus. In Roman mythology, a deity who presided over boundaries and frontiers. When a boundary was fixed, a sacrifice was made, and a trench dug, into which the body of the animal, together with other offerings, was put. A fire of pine branches was then lighted in the trench and the stone or emblem of Terminus was erected upon the ashes.

Termite (Lat. *termes*, a wood-worm). Insect of the order Isoptera (Gr. *isos*, equal; *pteron*, wing). Popularly called white ants, termites are pale-coloured, soft-bodied insects, nearest related to cockroaches. They undergo incomplete metamorphosis, and have no waist or constriction between the thorax and abdomen; in all these features they differ from true ants

(*q.v.*). Native to the tropics, they become scarcer in other regions, and only a few kinds occur in S. Europe. More than 2,600 species are known, all of which are social, living in large communities.

Each colony usually consists of winged and wingless reproductive males and females together with sterile workers and soldiers, also comprising both sexes. The nest is usually underground with conical projecting mounds above ground up to 20 ft. high; or it is tunnelled into wood or formed on a tree. At certain times winged males and females leave the nest in swarms and, after mating and casting off their wings, form new colonies. The females develop into huge whitish inert objects that may lay several thousand eggs daily. Supplementary reproductive males and females are wingless.

Workers are the most numerous individuals; they build the nest and feed the other occupants. The soldiers have huge heads and jaws, or a long funnel-like snout; they defend the colony, those of the second kind ejecting an acrid fluid some distance through the snout. Wood-feeding termites are highly destructive to woodwork and other materials, causing great monetary loss unless special precautions are taken. *Consult* Our Enemy the Termite, R. E. Snyder, 1935.

A. D. Imms

Termonde. Name sometimes used for the Belgian town also known as Dendermonde (*q.v.*).

Tern (*Sterna*). Genus of sea-birds of the gull family (*Laridae*). Characterised by their long wings, forked tails, and short legs, they feed mainly upon fish, which they snatch from the sea with great skill. They are poor walkers, and



Tern. Common species of the British long-winged sea-bird
W. S. Berridge, F.Z.S.



Termite. A termite mound at Port Darwin, Australia. It is 18 ft. high
W. Saville Kent

when seen on land are mostly resting. The buff or greenish eggs, blotched and spotted with brown, black, or grey, are laid on rocks, islets, stacks, dunes, or shingle-banks, in a nest of grass and rubbish, or in a naked depression. Five species—common, Arctic, roseate, little, and Sandwich terns—breed in Great Britain, while several others are occasional visitors. *See* Wideawake.

Tern. River of Shropshire, England. It rises in the N.E. of the co., and flows S.W. to join the Severn at Atcham, 4 m. S.E. of Shrewsbury, after a course of 30 m. Its chief affluent is the Roden.

Terni. City of Italy, capital of a prov. with the same name, in Umbria. It stands on the river Nera, near its union with the Velino, 50 m. direct and 68 m. by rly. N.N.E. of Rome. The 13th century cathedral which had been much altered and restored was severely damaged by direct hits in the Second Great War, when Terni as a whole was the worst damaged city of Umbria. It was captured June 15 by Indian troops of the 8th army. Ancient relics of Terni are an amphitheatre, theatre, baths, temple, sculptures, and a necropolis. In the vicinity are the Velino waterfalls, described by By-

ron in Childe Harold, the "marble cascade" descending about 650 ft. in a series of leaps. These have been harnessed to generate power for Rome and a large part of Central Italy. Pop. 68,890.

Terpander (*fl.* c. 700 B.C.). Greek poet and musician. A native of Lesbos, he wrote lyrics of which only scanty fragments have survived, and is said to have been the first to set poetry to music. He improved the existing four-stringed lyre by the addition of three strings.

Terpenes. Hydrocarbons which form the chief constituents of the essential oils obtained from plants. The terpenes are all isomeric, possessing the molecular formula $C_{10}H_{16}$. They are colourless volatile liquids with the exception of camphene, which is a solid resembling camphor.

Pinene, one of the groups, is a constituent of American and French oil of turpentine. From it an artificial camphor is obtained. Limonene, another terpene, occurs in lemon, orange, bergamot, and caraway oil.

Terpineol. Thick liquid with a smell resembling hyacinths or white lilac. It is obtained by the action of dilute acids on terpine hydrate. It is used in compounding lily-of-the-valley, hyacinth, and may-blossom perfumes, and as a perfume for soap.

Terpsichore. In Greek mythology, one of the nine Muses. She presided over dancing. *See* Muses. *Pron.* Terp-sickory.

Terra or **TELLUS.** In Roman mythology, the deity whom the Romans identified with the Greek goddess Gē, the Earth. She was the personification of the fruitful power of the soil, represented in art as a matron with cornucopia.



Terni, Italy. The Marble Cascades, where the Velino falls from a height of 650 feet into the river Nera

Terrace (Lat. *terra*, earth). Raised level bank of earth. In geology terraces are stretches of rocks or land in shelf-like contours. Such steps or shelves are most noticeable along sea coasts, the shores of lakes and rivers, and they often appear in a series of two, three, or more rising steadily from the shore, the oldest being the highest. Terraces along river banks mark the previous levels of floor plains which have been dissected by the river deepening its bed; in lakes they show the way the level has fallen. They are of value in the history of man as being frequent sources of discovery of Palaeolithic implements. Terraced hill-sides often occur in regions of flat-lying strata as a result of differential erosion, where harder beds form flat steps capping steeper slopes—outcrops of softer ones. A few terraces have been the result of volcanic action, etc., but none are so level and regular as those formed by the action of water.

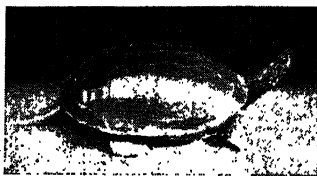
Terrace Garden. Form of garden arrangement originally practised among the hillsides of Italy. It consists in excavating steeply sloping ground into a series of steps or terraces, so that level surfaces may be obtained for plants. In France, the gardens at Versailles represent terrace gardening in its most conventional form, while in England the terrace gardens at Longford Castle, Salisbury, and at Richmond, Surrey, are notable examples. See Hanging Gardens of Babylon.

Terracina. City of Italy, in the prov. of Rome. It stands on the coast, at the S. extremity of the Pontine Marshes, where the Volscian Hills reach the sea 58 m. direct and 76 m. by rly. S.E. of Rome. The old town lies on the higher slopes of Mt. Teodorico, formerly crowned by a temple of Venus, the reputed dwelling place of Theodoric. Situated on the Appian Way (*q.v.*), Terracina was important in Roman times. The cathedral is built into the remains of a temple; the market place now occupies the forum, whose pavement is in an excellent state of preservation. In the lower town, by the harbour, are traces of Roman baths, amphitheatre, and remains of Etruscan tombs and walls. The city is supplied with water by a Roman aqueduct. Anciently called Anxur, Terracina was for long the capital of the Volsci. A collection of coins and other small objects were looted by the Germans during the Second Great War, in which Terracina was captured

by U.S. troops May 24, 1944; the city suffered little damage. Pop. est. 8,000.

Terra-cotta (Ital., baked earth). Unglazed earthenware of fine fired clay, either red or yellow. In English use the term is rarely applied to pottery. The ancient Greeks employed terra-cotta extensively in architecture and statuary. Thousands of statuettes have been found deposited in tombs and temples, many 4th and 3rd century examples from Tanagra, Eretria, and Myrina being exquisitely beautiful representations of the daily life of women and children. Etruscan terra-cotta sarcophagi are often very fine. The Romans applied terra-cotta to a great variety of purposes.

In the 14th century architectural decoration in terra-cotta revived in Germany and N. Italy, and much



Terrapin. Species of water tortoise, used as food in the U.S.A.
W. S. Berridge, F.Z.S.

use was made of it in the Renaissance age. The terra-cotta reliefs and portrait busts of the great Florentine sculptors are among their best work. In the second half of the 19th century the material was much favoured for facing and decorating important buildings, partly because of its resistance to the corrosive action of the atmosphere of great cities. See Della Robbia; Peru.

Terramara (Ital., marl-earth). Term originally denoting an earthy fertiliser derived from artificial mounds in the Po valley, and since 1871 used for the mounds themselves and their culture. Dating from late Neolithic times (Theiss valley, Hungary), they were developed in the early Bronze Age, sometimes on marshy land, but mostly on dry foundations, by peoples familiar with the lake-dwellings (*q.v.*). A moat was formed round an earthwork lined with timber, the enclosure being filled with piles supporting a timber platform. This bore wattle-and-daub huts, arranged in streets, sometimes 50 ft. wide. One near Parma had a moat 100 ft. wide.

Terra Nova. Name of the vessel which carried the Antarctic expedition of Capt. R. F. Scott (*q.v.*), 1910. She was a wooden whaling-

vessel of Dundee, measured 187 ft. in length, and was rigged as a barque, with additional steam-power. See Antarctic Exploration.

Terranova. Seaport of Sicily, in the prov. of Caltanissetta. It stands on the S. coast, near the mouth of the river Terranova, 60 m. W. of Syracuse, and 74 m. by rly. S.E. of Agrigento. Mussolini restored to Terranova and its river the name Gela (*q.v.*), on the site of which ancient city it is built. It has some remains of antiquity, the most interesting being Greek terra-cotta vases and sarcophagi from its necropolis. Near Terranova U.S. troops landed July 10, 1943, and occupied the town, which they held despite strong German attacks in the vicinity. The town suffered little damage. Pop. est. 27,000.

Terrapin. Name applied to various water tortoises of the order Testudinata, but attaching specially to *Malaclemys centrata*, a native of the salt marshes on the E. coast of N. America. An omnivorous feeder and of amphibious habits, the terrapin is about 8 ins. long in the female and 5 ins. in the male. The upper shell or carapace is keeled along the middle line, of a brown or greenish tint with dark concentric lines; the lower shell or plastron is yellow. See Tortoise.

Terre Adélie. Antarctic territory belonging to France. See Adélie Land.

Terre Haute. City of Indiana, U.S.A., the co. seat of Vigo co. It stands on the river Wabash, 72 m. W.S.W. of Indianapolis, and is served by several rlys. It is the centre of an agricultural and coal mining region, with more than 200 industrial establishments. Federal troops occupied the city in 1935 when workers' unions called a general strike. Terre Haute, which dates from 1816, became a city in 1833. Pop. 62,693.

Terreplein. Technical term used in two senses in military engineering. In permanent fortifications the terreplein is the flat surface of the rampart, on the front portion of which the parapet is formed, and where the defenders stand concealed from the enemy's view. In field fortifications terreplein is occasionally used to define any prepared level base on which a battery is placed.

Terrestrial Magnetism. This subject is treated in the article Magnetism.

Terrier. Group of domestic dogs. Its name (Fr. *terrier*, a rabbit burrow) indicates the original use of these dogs for unearthing game,

and is used to include dogs such as the bull-terrier, and others whose relation to the true terriers is rather remote. All terriers have short, arched skulls and alert appearance, and possess a high degree of intelligence. *See* Airedale; Bull Terrier; Cairn Terrier; Dog, colour plate; Fox Terrier; Griffon; Irish Terrier; Scotch Terrier; Skye Terrier; Yorkshire Terrier.

Terrigenous Deposits. In geology, term applied to sediments formed of material derived from pre-existing rocks. Sandstones, shales, etc., are included, as they are formed from sands and clays washed down from land areas by rivers or eroded from shore-lines. Limestones of organic origin, and beds of rock salt, etc., which are chemical deposits, do not come under this heading. *See* Sedimentary Rocks.

Terriss, WILLIAM (1847-97). Stage name of the British actor, William Charles James Lewin. Born in London, Feb. 20, 1847, he

had a varied career as merchant-seaman, sheep-farmer, and tea-planter before adopting the stage as a profession.

He made his first appearance in London in T. W. Robertson's comedy, *Society*, in 1865, and scored his first considerable success as Squire Thornhill in Wills's *Vicar of Wakefield* at The Court, March 30, 1878. Having been in Irving's company at The Lyceum, 1880-85, he took the part of the hero in *The Harbour Lights* at the Adelphi, 1885. He was stabbed to death outside the Adelphi, on Dec. 16, 1897. His daughter Ellaline (wife of Sir Seymour Hicks, *q.v.*), b. April 13, 1872, won many successes in musical and drawing-room comedy.



William Terriss,
British actor
Downey

to take the field against a continental professional army.

In 1907 the volunteers and yeomanry were amalgamated to form the Territorial Force, and organized into a self-contained second-line army for home defence. The establishment was fixed at 265,000 officers and men contained in 14 infantry divs. and 14 cavalry bdes. with ancillary corps. The U.K. was divided into districts, and the counties taken as units, each co. having a territorial force association, under the lord lieutenant, with a council composed of military, representative, and co-opted members. The co. associations received a grant for the expenses of the force. Each infantry battalion was attached to a regt. of the line and numbered after the regt.'s special reserve battalions. Volunteer corps from universities and public schools became officers' training corps.

Men from 17 to 35 years of age were eligible for enlistment and engaged for four years. They undertook to serve in any part of the U.K. in event of invasion, could be embodied only after the army reserve had been mobilised, could serve only in their own units, and could not be used to supply drafts for the regular army. Units of the force could be sent overseas only after a special authorising Act of parliament, and such units could contain only men who volunteered for overseas service.

First Great War

At the outbreak of the First Great War, the territorial force was at full establishment, and when embodied most of the officers and men volunteered for service overseas. A number of infantry battalions were immediately drafted to India to replace regular regts. brought to France, and in the first four months of the war 70,000 territorials were abroad. Early in 1915 the first territorial divs. went to the western front, and before the war ended 21 territorial divs., totalling more than a million men, were serving in all theatres of war. The force suffered 541,245 casualties, of whom 115,576 were killed.

Immediately after the war most territorial units were placed in suspended animation. In 1921, a reconstruction was carried out and the title changed to Territorial Army. Establishment was fixed at 345,000, of which only 50 p.c. were to be recruited in peace-time, and officers and men engaged to serve in any part of the world on embodiment. The reconstruction

THE TERRITORIAL ARMY

David Le Roi, historian of the Territorial Army

Here is an account of the history and organization of the second line to the British regular army. See also Army; Auxiliary Territorial Service; Militia; Volunteer; Yeomanry

The Territorial Army is a British military organization in which personnel serve part-time in peace but are liable to mobilisation in war. Voluntary spare-time soldiering has a long tradition in Great Britain and from the earliest period national emergency inspired spontaneous offers of national service in defence of the realm. Most were on a strictly local basis and were constituted partly on the old Saxon fyrd, or compulsory militia, and partly on voluntary enlistment. One such was the trained bands raised in London by James I. A purely voluntary military body was the Fraternité of S. George formed in 1537 (*see* Honourable Artillery Company).

The territorial army derives from the unpaid yeomanry regts. first raised in 1761 for home defence and the suppression of riots. During the Napoleonic wars further yeomanry regts. were established, together with volunteer infantry regts. By 1803 a volunteer army of some 400,000 infantry and cavalry had been enrolled to resist the threatened French invasion. With the exception of the yeomanry, the volunteer troops were badly trained and ill-equipped and at the end of the Napoleonic wars were, except for a few yeomanry regts., disbanded.

In 1859, when there was renewed danger of French invasion, the govt. raised a number of volunteer rifle and artillery units for home defence. Volunteers had to supply their own uniform and equipment, and were unpaid, the govt. providing only their weapons. By 1860 more than 180,000 men had enrolled and the volunteers were placed on a permanent basis.

In 1872 the volunteers were incorporated formally with the regular regts. of their districts, the volunteer unit becoming the volunteer battalion of the regular regt. Nine years later the volunteers and yeomanry were clothed and equipped at govt. expense. By 1892 there were 250,000 infantry and artillery volunteers and 150,000 yeomanry.

During the S. African War, a force of 35,520 yeomanry volunteers served in S. Africa, together with 19,856 men drawn from volunteer infantry units who served either in service companies attached to their appropriate regular regts. or in the specially organized City of London Imperial Volunteers. Although the work of these troops won them high praise as individuals, a royal commission set up in 1904 criticised the volunteer and yeomanry organization as unfit

brought the force more into line with the regular army, and new units were introduced, such as signal and armoured car companies. Units of the territorial army continued to be administered by the co. associations, but their training was the responsibility of the military commands of the areas in which they were situated.

In 1935 the territorial army had a strength of only 130,000. In 1937 its establishment was raised to 200,000, and the territorial army was made responsible for the ground defence of the U.K. against air attack. By the end of the year its strength was 160,000.

After the Munich Crisis (*q.v.*) of Sept., 1938, its strength rose to 224,000 all ranks, of whom nearly 70,000 were in five A.A. divs. The strength of the territorial field army was doubled to 24 infantry divs. (six motorised) and two armoured divs. A women's corps, the Auxiliary Territorial Service, was also established.

Other reforms included the appointment of the director-gen. of the territorial army as a member of the army council, and a territorial officer as deputy director-gen. The command of divs. was opened to territorial officers. Increased grants were made for annual training, training bounties for men, and larger travelling expenses were allowed.

Second Great War

The calling-up of the militia led to a shortage of equipment and instructors for the territorial army, and when it was embodied at the outbreak of the Second Great War the territorial field army was only partially trained and equipped. Territorials immediately became part of the regular army, and all men enlisted for the duration became members of the territorial army. Consequently, most units and divs., although retaining their territorial army titles, were no longer composed exclusively of territorial personnel.

At the end of the war territorial units were placed in suspended animation until Jan., 1947, when the territorial army was re-formed. Its volunteer strength was fixed at 150,000 men contained in six infantry divs., two armoured divs., and one airborne div., besides independent infantry and armoured bdes., artillery and engineer formations, and A.A. bdes. The territorial army was given the main responsibility for home A.A. and coast defence, but all units became liable for overseas service in an emergency provided parl.

sanction were first obtained. In 1950 the Territorial Army absorbed for their obligatory part-time service the majority of the national servicemen who had completed their term with the regular army. At the same time a number of territorial units were amalgamated and others changed their arm of the service.

Volunteers for the territorial army must be between 18 and 40 years of age, with certain extensions up to 58 for service in static A.A. units. Initial engagement is for four years. Territorials must do 40 hrs. training a year and attend an annual camp for 15 days. The camp period may be reduced by attending extra drills. For training periods over 48 hrs. normal army rates are paid. Volunteers are eligible for commissions.

Territorial Efficiency Decoration. British military decoration awarded to officers of the territorial army. Instituted in 1930, it replaces the Volunteer Officers' decoration (1892), the Colonial Auxiliary Forces decoration (1899), and the Territorial decoration (1908). It is awarded for 20 years' efficient and meritorious commissioned service in the territorial army or auxiliary military forces throughout the Empire. War service counts as double, while half the time served in the ranks or in the ranks of a cadet force reckons towards the qualifying period. The medal consists of an oval oak wreath in silver, having in the centre the royal cipher and crown in gold. It is suspended from a green ribbon with a yellow central stripe. At the top of the ribbon is a brooch inscribed to denote whether the recipient served in the territorial army or an imperial auxiliary force. Recipients in the Honourable Artillery Company wear the medal suspended from a ribbon in the Royal racing colours, half red and half dark blue edged with yellow. This distinction was granted by Edward VII.

Territorial Efficiency Medal. Medal formerly awarded to other ranks of the territorial army. Instituted in 1908, it superseded the Volunteer Long Service medal, and was awarded to men who had completed 12 years' efficient service. After the Second Great War, the Territorial Efficiency medal was replaced by the Efficiency Medal (*q.v.* in N.V.).

Territorial Waters. Conception in international law. Such waters are adjacent to the shores of states and are deemed to be in-

cluded in their dry land jurisdiction. Territorial waters were first defined by convention towards the end of the 18th century between Great Britain and the U.S.A. It is said that the three-mile limit agreed on represented the range of the cannon of that time. Most nations accept 3 m., though Denmark, Norway, and Sweden claim 4 m.; Chile, Turkey, and Uruguay 5 m.; France, Portugal, and Spain 6 m.; U.S.S.R. 12 m. The distance is reckoned from low water mark. Within this limit all shipping can go about its lawful occasions; but to fish in the territorial waters of a foreign power is trespass. Cases involving fishermen come before courts of the state in whose waters the men have been arrested. A foreign ship in port is subject to the jurisdiction of the riparian state.

Territory (Lat. *terra*, earth). Land belonging to a city or state. The district over which a state exercises sovereignty is its territory. In a more specialised sense, the word is used in the U.S.A. for a district which has not received state rights. Of the existing states 28 were organized as territories before they became states. Canada and Australia, Argentina and Brazil, use the word in the same sense; Canada has the North-West Territories and Australia Northern Territory. See Federalism; Sovereignty; State.

Terror. Dormant volcano on Ross Island, South Victoria Land, Antarctica. It is situated in lat. 77° 30' S., and reaches an alt. of about 11,000 ft. It was discovered by Capt. (afterwards Sir) James Ross, Jan. 28, 1841. See Erebus.

Terror, THE. Name given to a period in the French Revolution. It may be said to have begun on June 2, 1793, when a rising in Paris led to the supersession of the Girondist faction in the national convention by that of the Jacobins; and ended on July 28, 1794, with the execution of Robespierre and his associates. Thousands of persons, royalists, Girondists, soldiers, and publicists, men and women, were sent to the guillotine in Paris or otherwise put to death in such cities as Lyons, Bordeaux, Nantes, Arras. Taine enumerates 17,000 victims, but this figure is certainly low.

Terry, CHARLES SANFORD (1864-1936). British historian. After education at Lancing, and Clare College, Cambridge, he was lecturer in history at Durham college of science, Newcastle, 1890-98, then transferred to Aberdeen, as



Ellen Terry in some of the parts which made her famous. 1. Portia. 2. In title-rôle of Nance Oldfield. 3. Lady Macbeth



professor in 1903. He wrote extensively on Scottish history, his many books including *The Scottish Parliament*, 1906; *A History of Scotland*, 1920; and *The Jacobites and the Union*, 1922. He also became an authority on the music of Bach, and published several books on the work of that composer. Terry died Nov. 5, 1936.

Terry, EDWARD O'CONNOR (1844-1912). British actor. Born in London, the son of an actor, he went on the stage in 1863, and during 1868-75 was principal comedian at the Strand Theatre, London, making a special success in 1874, as Paul Pry in Poole's comedy of that name. He played in various burlesques at the old Gaiety Theatre, 1876-85, and in 1888 produced at the theatre called after his name Pinero's sentimental comedy, *Sweet Lavender*, which furnished him with his most famous part, that of the bibulous barrister, Dick Phenyl. Terry died in London, April 3, 1912.

Terry, DAME ELLEN ALICIA (1847-1928). British actress. Daughter of Benjamin and Sarah

Terry, popular provincial actors, she was born at Coventry, Feb. 27, 1847, and at the age of 9 made her first appearance, as Mamillius, at the Princess's Theatre, London, in Kean's revival of *The Winter's Tale*. In 1864 she married the painter, G. F. Watts. This marriage was soon dissolved, and Ellen Terry returned to the stage in 1867, when she played Katharine to Irving's Petruchio.

She retired from the stage for six years (1868-74). Then, joining the Bancrofts in 1875, she

scored several successes with them. Having married E. A. Wardell (Charles Kelly, who died 1885), she became in 1878 Irving's leading lady, and began the series of triumphs in Shakespearian and other plays which made her queen of the English stage. Her greatest rôles were Portia, 1879; Juliet, 1882; Viola, 1884; Nance Oldfield, 1891; *Madame Sans-Gêne*, 1897; *Clarisse*, 1899. In 1902 Ellen Terry and Mrs. Kendal appeared in *The Merry Wives of Windsor*, under Tree, at His Majesty's. She celebrated her jubilee on the stage in 1906, and the following year married an American actor, James Carew. In 1915 she toured the U.S.A., lecturing on Shakespearian heroines. She was created G.B.E. 1925, and died at Tenterden, July 21, 1928. *See Acting; consult also* Life, C. Hiatt, 1898; *Ellen Terry and Her Sisters*, T. E. Pemberton, 1902; her own *Story of My Life*, 1908; *Correspondence between E. T. and Bernard Shaw*, 1931; *Ellen Terry's Memoirs*, E. and C. St. J. Craig, 1933.

Terry, FRED (1863-1933). British actor. Born in London, Nov. 9, 1863, the brother of Ellen Terry, his first stage appearance was at the Haymarket Theatre in 1880. The next few years he toured with Ben Greet's and other companies, visiting America in 1885. Two years later he settled in London, and was successively in the companies of Tree, Forbes-Robertson, Alexander, and Irving. He married the actress Julia Neilson (*q.v.*), and was the father of Dennis and Phyllis Neilson-Terry (*q.v.*). Fred Terry and Julia Neilson, who soon formed their own company,

made a reputation for romantic historical plays, noteworthy productions being *Sweet Nell of Old Drury*, Haymarket Theatre, 1900, and *The Scarlet Pimpernel*, New Theatre, 1905. In such plays, and in *Henry of Navarre*, they toured with great success, almost until Fred Terry's death, which occurred April 18, 1933.

Terry, SIR RICHARD RUNCIMAN (1865-1938). English musician. Born at Ellington, Northumberland, he was educated at both Oxford and Cambridge. He was organist successively at St. John's cathedral, Antigua, and Downside abbey, and in 1901 was appointed organist at Westminster R.C. cathedral, a post he held until 1924. He was also lecturer at Birmingham and Leeds universities, and examiner in music for many organizations. The composer of five masses, a requiem, and other church music, he did much to revive interest in 16th and 17th century composers both by performing their works and editing them for publication. A lover of sailing, a pastime he enjoyed with his uncle Walter Runciman (1847-1937, 1st Baron Runciman), Terry was in secular music the populariser of sea chanties (he insisted on spelling them shanties), collecting, editing, and publishing two



Ellen Terry
Heated



Fred Terry,
British actor



Sir Richard Terry,
English musician

vols. of these sailors' songs. Knighted in 1922, he died April 18, 1938. A memoir, *Westminster Retrospect*, by H. Andrews, appeared in 1948.

Terschelling. Island of the Netherlands, in the prov. of N. Holland. It lies between the islands of Vlieland and Ameland. The flat, sandy surface is cultivated in parts. Hoorn is the chief town; fishing is carried on from Westerschelling. Its area is 41 sq. m. See Frisian Islands.

Tertian Fever. Form of intermittent malarial fever in which paroxysms recur on alternate days.

Tertiary. Epoch of geological time between the end of the Cretaceous and the beginning of the Quaternary or Pleistocene periods. It was between 20 and 70 million years ago approximately. It is subdivided into the Eocene, Oligocene, Miocene, and Pliocene periods, the last-named being the youngest. The first two are sometimes together termed Palaeogene, and the latter pair Neogene. Eocene and Oligocene beds occur in England in the London and Hampshire Basins, which are downfolded (synclinal) areas separated by the Wealden dome. The sediments are still unconsolidated, and the two most important groups are the London Clay and the Bagshot Sands. The former is up to 500 ft. thick locally, and its impervious clayey character allows it to be tunnelled relatively easily: hence London's ramifying system of deep underground rlys. The Bagshot Sands form the sandy country N. of Guildford and Farnham; used for military training.

Miocene deposits do not occur in Great Britain, but they are extensively found elsewhere in Europe. This period is of great importance because in it took place the great mountain-building movements which formed the Alpine-Himalayan ranges, the Rocky Mts., and the Andes. The movements had already begun, but in this period they reached maximum intensity. In the Alps the sediments were thrown into enormous recumbent folds which were thrust one on top of the other forming nappe structures. In England the effect of the Alpine storm resulted in the folding of the beds in the London and Hampshire Basins, the Weald, the Isle of Wight, and in the Portland-Purbeck area of Dorset.

An early effect of these movements was the outbreak of volcanic activity in N.E. Ireland, N.W. Scotland, Iceland, and Greenland

during the Eocene period. The whole volcanic field is referred to as the Thulean province. The volcanic episode began with basalt eruptions from numerous fissures, which resulted in great floods of lava covering the pre-existing landscape. In Mull the charred remains of forest trees are still recognizable. This early phase was then followed by activity which was confined to individual centres. The remains of such great central volcanoes are known in Skye, Rum, Ardnamurchan, Mull, Arran, Slieve Gullion, and the Mourne Mts.

Pliocene beds are found in East Anglia. They are termed "*crag*s"—Coralline Crag, Red Crag, etc.—and consist of unconsolidated shelly sands, clays and gravels.

Life in the Tertiary showed the strong development of mammals and the dying out of the great saurians of the Mesozoic epoch. Ancestors of the horse and rhinoceros appeared early in the epoch; sharks were common. Ancestors of the elephant did not appear till the Miocene and were accompanied by the sabre-toothed tiger and the first deer and apes. See Cretaceous; London Basin; London Clay; Rock.

Gilbert Wilson, Ph.D.

Tertiary (Lat. *tertius*, third). Name applied in the R.C. church to a secular member of a religious order, who is so called as coming third to a professed cleric or woman of the order. The opening of the devout life to men and women living in the world instead of in a religious house, though older than the 10th century, was developed by S. Francis, who made tertiary a branch of the order he founded, and other rules made provision for their admittance. The general points which tertiaries bind themselves to observe are abstinence from strife or mischief-making; frequent reception of the Sacraments; daily mass; the exercise of penance; and universal charity. See Oblates.

Tertis, LIONEL (b. 1876). British viola player. Born at W. Hartlepool, Dec.



Lionel Tertis,
British viola player

29, 1876, he studied at Leipzig and the R.A.M., where he was encouraged by Mackenzie to take up the viola. Hampered at first by the small amount of solo music

written for that instrument, he arranged much originally written for violin, and also performed works specially composed for him by Sir A. Bax, Bridges, and Cyril Scott. Acknowledged master of the viola, he toured Europe and the U.S.A. and gave regular recitals in London. He designed a new type of viola, and wrote *Beauty of Tone in String-Playing*, 1938.

Tertullian (c. 155—c. 230). Christian theologian, whose full name was Quintus Septimius Tertullianus. The son of a Roman centurion, he was born at Carthage, was well educated, and probably became an advocate. Converted to Christianity about 190, he was ordained priest, and devoted his life to the defence of the faith. His anger at the worldly and temporising policy prevalent in the Church led him about 202 to adopt the Montanist heresy, and he became the leader of the Montanist sect in Africa. Of his many works the chief is the *Apologeticum*, a powerful defence of Christianity and indictment of paganism.

Tertullian was a man of vehement and uncompromising spirit, and attacked not only every form of vice, extravagance, and folly, but even innocent culture, in the spirit of a pleader rather than of a philosopher. His sincerity is beyond doubt, and his fervent zeal gives his language extraordinary force. The founder not only of the African school which was to culminate in Augustine, but of Christian Latin literature, he was a literary genius who broke away from the classical tradition, and with his copious vocabulary and amazing command of rhetorical devices created a new instrument for the new thought of his age.

Teruel. Inland prov. of N.E. Spain, forming the S. portion of Aragon. It is bounded N. by the prov. of Saragossa, W. by Guadalajara and Cuenca, E. by Tarragona and Castellon, and S. by Valencia. The surface is largely mountainous, and contains the Sierras de Gudar and St. Just, the Montes Universales, and other highlands. The Pico Javalambre, in the S., rises to 6,627 ft. The prov. is watered by the Guadalaviar, the Guadalupe, and other streams, and, though fertile, is backward in cultivation and commerce. There are minerals and forests, but communications are bad. Forestry, agriculture, mining, and weaving are the chief occupations. Beyond the capital, Teruel, there are no large towns. The area is 5,721 sq. m. Pop. 219,518.

Teruel. City of Spain, capital of the prov. of Teruel. It stands at an alt. of over 3,000 ft., on the river Guadalaviar and the Valencia-Calatayud rly., 70 m. N.W. of Valencia. An ancient walled town, with crumbling buildings and narrow, ill-paved streets, it still retains a medieval aspect. There are a 16th century Gothic cathedral and many interesting churches. Water is supplied to the town by a magnificent aqueduct. Pop. 13,584.

At the outbreak of the Spanish Civil War in 1936, Teruel declared for the Nationalists, and provided them with a valuable sallyport for an offensive towards the Mediterranean. On Dec. 15, 1937, the Republicans launched a determined attack against the place as part of their pincer movement to cut the Saragossa-Teruel road. After bitter fighting most of the city was occupied by Dec. 23, and it surrendered on Jan. 3, 1938. The fury and intensity of this attack upset the Nationalists' offensive plans and caused them to use up reserves intended for an attack on Madrid; but in Feb. they recovered Teruel.

Terza Rima (It., third rhyme). Italian verse form. Probably suggested by similar Provençal forms, it was perfected by Dante, and employed by him in *The Divine Comedy*. The line is iambic, in Italian with 11 syllables, and in English generally 10. The rhyme scheme is aba, bcb, cdc, ded, etc., continuing indefinitely, and closing with a rhymed couplet. Among English examples are Chaucer's *Complaint*; *The Triumph of Life* (Shelley); and *The Prophecy of Dante* (Byron).

Teschen (Czech. Tesin; Polish Cieszyn). German and best known form of the name of a town and area of Silesia, central Europe. The town stands on the right bank of the Olsa, a trib. of the Oder. The area, c. 350 sq. m. in extent, and once an independent principality, fell in 1625 to the crown of Bohemia, and in 1722 to Austria. The notable treaty which ended the war of the Bavarian succession was signed at Teschen, May 13, 1779. The pop. of the area is mixed: in 1910, the Austrian census showed 69 p.c. Polish; the Czecho-Slovak census of 1931 showed 34 p.c. Polish. In 1920 the conference of ambassadors gave the town to Poland, except the rly. station which, with the rest of the area, went to Czecho-Slovakia. At the time of the Munich crisis (g.v.) in 1938 Poland demanded the

whole area, and Czecho-Slovakia ceded it. After the Second Great War Czecho-Slovakia resumed occupation of the area awarded to her in 1920, and in March, 1947, entered into an agreement with Poland under which Poles in Czech Teschen were granted legal right to their own schools, etc. Among the industries of the area are coal mining, cloth weaving, flax spinning, tanning, and the manufacture of clocks, screws, and furniture. Pop. est. 25,000.

Teschenite. Igneous rock akin to gabbro and dolerite but containing analcite. It is found in Leicestershire, Scotland, and near Teschen. See *Igneous Rocks*; *Theralite*.

Tesla, NIKOLA (1857-1943). American inventor. Born at Smiljan, Serbia, and educated at Graz and Prague university, he was employed in the telegraphs department of Austria until 1881, when he joined an electrical company in Budapest. In 1884 he went to America, became naturalised, and for a time worked for Edison. He discovered the rotary magnetic field which resulted in the multi- and polyphase systems of electric current transmission. Tesla invented many electrical appliances and improvements, including the Tesla coil, oscillators, arc lamps, etc., and carried out remarkable experiments in alternating currents of high frequency and potential which proved beneficial in curing skin diseases. Later he did valuable work on electronics. He died Jan. 7, 1943.

Tessin, CARL GUSTAF, COUNT (1695-1770). Swedish statesman. He was born at Stockholm, Sept. 15, 1695, son of Count Nicodemus Tessin, a distinguished architect. Having been ambassador in Vienna, 1725, he became active in political life at home, notably as one of the leaders of the Hat party, which in 1738 began its long exercise of power that kept Sweden embroiled with foreign peoples. During 1739-42 he was ambassador at the French court; in 1744 he was sent on a special mission to Berlin; and during 1747-52 he was his country's chief minister. An admirer of French culture, Tessin was also an author, and his letters to Gustavus III were translated into English, 1755.

Tess of the D'Urbervilles. Twelfth novel of Hardy. Most of it appeared serially in *The Graphic* before its issue in volume form as *Tess of the D'Urbervilles*, a Pure Woman, in 1891. Tess, daughter of a Wessex rustic, Durbeyfield,

whose head is turned on being told that he is a descendant of the D'Urbervilles, becomes the victim of that discovery. Seduced as an ignorant girl by Alec D'Urberville, she marries the priggish Angel Clare, only to be left on her wedding day after confessing her past. Circumstances drive her back to her seducer, whom she kills on her husband's return, and she is hanged for the murder. The story impresses by its sense of tragic inevitability, of a fate against which the individual struggles in vain.

Test. River of Hampshire, England. It rises near Upton and flows S. past Stockbridge and Romsey to Southampton Water, which it enters near Totton. Near Fullerton it is joined by the Anton, and the united stream is sometimes known by that name.

Testacea (Lat. *testa*, shell). Term sometimes used for a group of invertebrate animals possessing a shell. See *Mollusca*; *Shell*; *Shellfish*.

Test Act. Act passed in 1673 ordering every office holder under the English crown to take the Sacrament according to the rites of the Church of England, and to declare against Transubstantiation. It was aimed mainly at the Roman Catholics, and was not repealed until 1828, but for many years before that it had been a dead letter as regards Protestant Non-conformists, for those who disregarded it were protected by an annual Act of Indemnity.

Testament (Lat. *testis*, witness). Word used for a solemn declaration, e.g. a will. Thus comes its use for the two parts of the Bible. One who leaves a will is called a testator. See *Bible*; *New Testament*; *Old Testament*; *Will*.

Testament of Beauty, THE. Philosophical poem by Robert Bridges. Completed in 1929, during the last year of the poet's life, when he was 85, it was dedicated to George V. It is in four books totalling 4,074 lines, mostly loose hexameters with an occasional pentameter, and, after an introduction, treats of beauty in terms of Selfhood, Breed, and Ethick. Argument and vocabulary are exceptionally subtle, and Bridges modifies spelling by such devices as doubling consonants and omitting a final *e* to indicate strong and weak syllables. The scale of the work entitles it to be called Bridges's masterpiece.

Testamentum Domini (Lat., Testament of the Lord). Apocryphal book, dating from about the

close of the 3rd century, or possibly later. It was first published in a complete form in 1899 by the patriarch of Antioch. It exists in Arabic and Syriac versions only, though originally written in Greek, and professes to record a number of the utterances of Christ after His resurrection. An English translation was published in 1902.

Testis. The essential male generative organ. In the human species the testes are two oval glands about 1½ ins. long, suspended in the scrotum by the spermatic cord. Besides forming the spermatozoa, they give rise to an internal secretion which passes into the blood and has an influence upon the whole body. At puberty this so-called secondary secretion renders the animal male, deepening the voice and causing hair to grow on body and face. The testes are formed in the abdomen and pass into the scrotum shortly before birth. It is not rare for the testes to remain undescended, but they usually come down during the first year of life.

Orchitis is acute inflammation of the body of the testis, and may be the result of injury, or follow mumps or other fevers. A hydrocele is an accumulation of fluid other than pus or blood in the vicinity of the testes or cord. Varicocele is a varicose condition of the veins associated with the testis. See Castration.

Test Match. International cricket match. The term is also used in other sports, e.g. speedway racing, but it implies *par excellence* a cricket match between England and Australia. These contests began in 1876, and are now played normally about every fourth year in each country, five games constituting a rubber (see Ashes). After the 1948 season Australia had won 64 tests to England's 55, leaving 34 drawn—these mostly in England, because in Australia the games were for years played out irrespective of time. In England, Australia had won 19 and lost 21; in Australia, England had won 34 and lost 45. The biggest score in an innings over the series is 903 for seven wickets, by England, in 1938; Australia's best total being 729 for six, in 1930. Lowest totals are 36 by Australia, 1902; 45 by England, 1886–87. D. G. Bradman (5,028) made the most runs for Australia and J. B. Hobbs (3,636) for England, while the most successful wicket-takers were respectively H. Trumble (141) and W. Rhodes (109). Test match grounds are Lord's, Kennington

Oval, Trent Bridge (Nottingham), Headingley (Leeds), Old Trafford (Manchester); Sydney, Melbourne, Adelaide, Brisbane. Test match captains have included: (England) W. G. Grace, A. E. Stoddart, A. C. MacLaren, F. S. Jackson, P. F. Warner, A. O. Jones, J. W. H. T. Douglas, C. B. Fry, A. E. R. Gilligan, A. P. F. Chapman, D. R. Jardine, G. O. Allen, W. R. Hammond, N. W. D. Yardley; (Australia) D. W. Gregory, W. L. Murdoch, P. S. McDonnell, M. Blackham, J. Darling, M. A. Noble, S. E. Gregory, W. W. Armstrong, H. L. Collins, W. M. Woodfull, D. G. Bradman.

South Africa really entered international cricket in 1907, and after the English tour of 1948–49 had won 12 tests to England's 34, with 28 drawn. In 1912 both this dominion and Australia sent sides over to play in a triangular tournament, but the experiment was not repeated. The longest test match on record entered the tenth day's play at Durban without result in 1939.

Here follow the dates on which other dominions first opposed England in representative cricket, with results up to Sept., 1950:

West Indies since 1928. England won 9 matches; West Indies 8; 8 drawn.

New Zealand since 1929. England won 4 matches; 14 drawn.

India since 1932. England won 6 matches; 4 drawn.

Test Paper or **INDICATOR PAPER.** Specially treated paper impregnated with an indicator solution and carefully dried. Many types of test paper are used for

(colourless to pink), thymol blue (yellow to blue). Test papers used to indicate the presence of chemicals include lead acetate (hydrogen sulphide), mercuric chloride (arsenic), starch (iodine), and turmeric (ammonia).

Testudo (Lat., tortoise). Military formation employed by the Roman soldiers, especially in siege operations. They held their shields above their heads and overlapping those of their comrades behind, forming a firm and unbroken covering. Thus protected, the attacking party could approach close enough to place their scaling ladders against walls.

Tetanus. Infective disease caused by the *Bacillus tetani*. See Lockjaw.

Tetany. Spasmodic contraction of the muscles, most often of the hands and feet. This muscular irritability is due to an abnormal calcium chemistry resulting from deficient secretion of the parathyroid glands. It occurs in children suffering from rickets, and less frequently in adults after removal of the thyroid gland, or in the course of certain diseases. Spasms cause the limbs to assume a characteristic condition, the fingers being pressed together so as to make the hand more or less conical, while the wrists and elbows are bent and the arms folded over the chest. Treatment is directed towards adjusting the calcium-phosphorus chemistry of the body. Calcium gluconate may provide a cure, and the administration of vitamin D is valuable.

Tetbury.

Market town and rural dist. of Gloucestershire, England. It is the terminus of a branch rly. from Kemble, 7 m. to E.N.E. Tetbury marks the site of an ancient British camp. The parish church of S. Mary Magdalene replaced a Norman church,

pulled down in 1777 except the tower and spire. A grammar school existed in James I's reign. There are three annual fairs. Market day, Wed. Pop of dist., est. 6,750.

Tete or **NYUNGWE.** Town in Mozambique. Situated on the Zambezi, 235 m. N.E. of Salisbury, Rhodesia, and about 260 m. from the sea, Tete is an important military station, where the Portu-



Tetbury, Gloucestershire. The old market house

testing alkalinity or acidity of fluids and for detecting presence of specific chemicals, e.g. litmus (red in acid and blue in alkaline solutions), brilliant yellow (yellow to orange), bromocresol purple (yellow to purple), chlorophenol red (yellow to red), congo red (yellow to violet), cresol red (yellow to violet), methyl orange (red to yellow), phenolphthalein

guesse have maintained a garrison since 1632. Here goods are transferred from river to road transport en route for N.E. Rhodesia. Gold, coal, asbestos, and uranium have been discovered in Tete district.

Tethys. In geology, name given by Suess (1831-1914) to an ancient elongated ocean which, including the present Mediterranean, stretched from Spain to the Himalayas. In it were laid down the deposits which later were folded to form the Alps, Carpathians, Balkan arcs, Caucasus, and Himalayas. This body of water persisted throughout the Triassic, Jurassic, Cretaceous, and early Tertiary periods, but disappeared, save for such remnants as the Mediterranean, Black, and Caspian Seas, when the Alpine-Himalayan mountain chains were upheaved. Tethys in Greek mythology was the daughter of Uranus and the wife of Oceanus.

Tetrachlorethylene OR PERCHLORETHYLENE (C_2Cl_4). Non-inflammable colourless liquid of ethereal odour. Widely used as an industrial solvent, it is an unsaturated halogenated hydrocarbon with physical properties not unlike those of carbon tetrachloride. It can be made by the action of chlorine upon ethylene. It has a medical use as a vermifuge against hookworm.

Tetrachord (Gr. *tetrachordos*, four-stringed). A succession of four sounds proceeding by step within the limits of a fourth. See Scale.

Tetrad. Biological term applied to a group of four similar units. Its most frequent applications are to the group of four spores formed from a mother cell after meiosis, and to the four chromatids which occur together during that process as a result of the synopsis of the pair of homologous chromosomes each longitudinally split.

Tetradymite (Gr. *tetradymos*, fourfold). In mineralogy, name given to a mineral consisting of an intermetallic compound of bismuth, tellurium, and sulphur— Bi_2Te_2S —with perhaps traces of selenium. The mineral has a metallic, steel-grey lustre, and is so-called from its common occurrence in twin crystals. It is often associated with gold-bearing quartz in veins formed at moderate to high temperatures; also in contact metamorphic deposits.

Tetragrammaton (Gr., of four letters). In a general sense, any sacred name of four letters, e.g. the Latin, *Deus*, God. The term is

specifically applied to the Hebrew JHVH (*Jod, He, Vau, He*), which the early Jews used in a mystical sense as a symbol of Jahveh or Jehovah (q.v.), and which early opponents of Christianity said that Christ employed to perform His miracles.

Tetrahedrite. One of the grey copper ores. A complex sulphide of copper and antimony, it frequently contains traces of other metals including silver, sometimes up to 30 p.c. Tetrahedrite occurs with other ores of copper, sometimes in lead-zinc deposits.

Tetrameter. In English verse, a line containing four feet, however the accents may fall. Rhymed iambic tetrameter has always been a favourite measure with lyric poets, e.g. Marlowe's *Come live with me and be my love*; also the whole of Tennyson's *In Memoriam* is written in it.

Tetrarch (Gr. *tettares*, four; *archein*, to rule). Ruler of one of four parts of a region. Losing its original meaning, the word came to be applied to minor rulers generally, and especially to the princes of Syria under the Roman emperors. Herod Antipas, to whom Christ was sent by Pilate, was tetrarch of Galilee (Luke 3).

Tetrazzini, LUISA (1871-1940). Italian singer. Born in Florence, she received an early musical education from her sister Eva, a musician, after which her unique voice was brought to perfection by Ceccherini. She first sang in L'Africaine at the Teatro Verdi in her native city, 1895, and sprang to fame in a night. Thereafter throughout her life she enjoyed unbroken success. On first appearing at Covent Garden in 1907, she sang Violetta in *La Traviata*. From 1908 to 1912 she was regularly at the Manhattan theatre, New York, and later moved to Chicago. Her last performance in England was at the Albert Hall in 1933. Tetrazzini was a prima donna in the great tradition, with a peerless voice in the coloratura style, charming presence, and vivid personality. She died at Milan, April 28, 1940. She published an autobiography *My Life of Song*, 1921.

Tetryl OR TETRANITROMETHYLANILINE. Service high explosive, commonly known as Composition

Exploding or CE. It is a yellow powder, melting at 131° C., made by the action of nitrating acid on a solution of dimethylaniline in concentrated sulphuric acid. Great improvements were made in the manufacturing process during the Second Great War, and to meet the increased requirement a continuous nitration and purification process was developed. Tetryl is more powerful and sensitive than T.N.T. and detonates fairly readily; therefore it is used almost entirely as a primer or booster. See Ammunition; Detonator; Explosives.

Tettenhall. Urban dist. and parish of Staffs, England, 2 m. W.N.W. of Wolverhampton, on the old London to Holyhead road. The church of S. Michael, of pre-Norman foundation, restored in the 19th century and badly damaged by fire in 1950, contains monuments of the Wrottesley family. Near Tettenhall a battle took place in 910 between Edward the Elder and the Danes. In the neighbourhood is Wrottesley Hall, the seat of Lord Wrottesley, whose family has owned it since the time of Henry II. The present building dates from 1696 and the park contains British remains. Tettenhall college is a nonconformist public school. Pop. 7,240.

Tetuan. Town in the N.E. of Morocco. It has lofty mts. in the background, is situated about 6 m. from the Bay of Tetuan, and is connected with its port, at the mouth of the Rio Martin, by a short rly. Another rly. runs to Ceuta, 25 m. Tetuan is the capital of the Spanish zone, and the h.q. of the Moroccan khalifa, who rules under the control of the Spanish high commissioner. There are Jewish and native colleges. Pop. 49,535.

Tetzel, JOHANN (c. 1460-1519). German friar. Born at Leipzig, the son of a merchant, he was edu-



Johann Tetzel,
German friar

cated there and became a Dominican in 1489. Eloquence as a preacher led to his employment in 1517 by the elector of Mainz as a seller of indulgences, half the proceeds being remitted to the pope towards the cost of building S. Peter's. Luther denounced this practice in his famous 95 theses, 1517. To these Tetzel replied with such extravagance as to involve himself in



Luisa Tetrazzini,
Italian singer

obloquy and disgrace, and he retired to the Dominican convent at Leipzig, where he died July 4, 1519. See Indulgences; Luther; Reformation.

Teucer. In Greek legend, first king of Troy. Teuceri was an alternative name for the Trojans. Another Teucer was the half-brother of Ajax, and fought on the Greek side at the siege of Troy. He was the best Bowman in the Greek host. See Troy.

Teutoburger Wald. Forested mt. range in N.W. Germany. It extends S.E. through the *Land* of North Rhine-Westphalia for about 70 m., culminating in the Völknerstod, alt. 1,536 ft. The name of the range is a modern rendering of the Latin *Salvus Teutoburgiensis*, where Arminius (*q.v.*) ambushed and destroyed three Roman legions under Varus, on their march into winter quarters, A.D. 9. The identification is doubtful but the German victory is commemorated by a colossal statue of Arminius, completed 1875, which stands on the Grotenburg in the Teutoburger Wald near Detmold.

Teuton. Name denoting a group of peoples, of the Caucasian or white race, whose languages constitute the Teutonic sub-family of Indo-European speech. The word Teutonic, used by late Roman writers as synonymous with Germanic, is preferred in modern English because Germanic is liable to confusion with German, which has a narrower implication. It is derived from the tribal name of the Teutones (*q.v.*).

Even in the infancy of Teutonic speech a homogeneous Teutonic race can hardly be postulated. The Bastarnae, an E. tribe encountered by the Macedonian power a century before the Teutones entered Italy, and afterwards absorbed into the Goths, exhibited that Celtic strain which usually accompanied the appearance of the Teuton in Alpine Europe. If the Teuton be pictured as tall, blond, long-headed, long-faced, with narrow aquiline nose, blue eyes, and light hair, that is tantamount to identifying him with the Nordic branch of the European race, which developed its most typical form in Scandinavia (see Ethnology). But each of these characters exhibits among the Teutonic-speaking peoples marked divergences, partly through geographical environment, partly through admixture in varying degrees with the Alpine and Mediterranean stocks. The resultant physical complex tends here and there towards rounder heads, more brunet

complexions, shorter faces, broader noses, greyer or darker eyes, and browner hair. The British people, from the racial standpoint, is barely half Teutonic. During the last 1,000 years B.C. the Teutonic-speaking peoples spread S., S.E., and W. from their homes on both sides of the W. Baltic, displacing and absorbing the earlier populations, Celtic and other, of central Europe.

Archaeology throws much light upon the prehistory of N. Europe, and edda and saga illustrate its primitive society. But this evidence fails to determine how far the Scandinavian civilization, with which the early poetry is mainly concerned, was shared by the manifold Germanic peoples S. of the Baltic coast. The lowly cultural level portrayed by Tacitus pertained mostly to the W. region, and during the early conflicts with Rome became sensibly modified by contact with the Mediterranean civilizations.

The various national migrations, from the 4th century onwards, emphasised those distinctive types of village communities, folkmoths, law based on *wergild*, land inheritance, servitude and kingship, which found a congenial home in post-Roman Britain, and influenced its later institutions. Some of this culture, as much Celtic as Teutonic, was a blend, and that it followed no uniform pattern is clear from the individual history of Ostrogoths and Visigoths, Vandals and Burgundians, Alamanni and Bavarians, Franks and Lombards, Saxons and Jutes.

Primitive Teutonic Religion

Nor can the primitive Teutonic religion be reduced to a common formula. Eight centuries elapsed after the first Christian conversions in Moesia before paganism disappeared in the far north. As a consequence much Teutonic mythology, as in *Beowulf*, bears traces of the infiltration of Christian ideas. At heart Teutonic paganism was based on old neolithic nature-worships. From these there emerged, by local development or by assimilation, the recognition of a sky-god *Tiw*, a wind-god *Odin*, a thunder-god *Thor*, *Frigg*, and many another.

They were pictured amid a multitude of demigods, Balder and Loki, Midgard-worm and Fenris-wolf, besides subordinate agencies such as norns and valkyries, giants and dwarfs. Divination by rune and other magical rites were practised, and religious philosophy originated such conceptions as *Yggdrasil's* ash, *Asgard*, *Valhalla*, and *Ragnarök*. See Ethnology; Europe; Germany; Mythology;

Scandinavia; consult also *The Races of Europe*, W. Z. Ripley, 1900; *The Archaeology of the Anglo-Saxon Settlements*, E. T. Leeds, 1913; *The Religion of our Northern Ancestors*, E. E. Kellett, 1914.

E. G. Harmer

Teutones or **TEUTONI**. Tribe living in N. Europe, probably in or near Jutland, in the 2nd century B.C. In 103 B.C. they marched S. to assist the Cimbri (*q.v.*), who were fighting in Gaul, but they were overthrown by Marius in 102 at *Aquae Sextiae* or *Aix*. Although the Teutones are by some considered to have been Celts, the name Teutonic, which like the German *Deutsch* and English *Dutch* means national, has become a designation for the whole Germanic race.

Teutonic Languages. One of the great divisions of the Indo-European family, also called the Germanic languages. Their hypothetical common source, Primitive Germanic (*Urgermanisch*), was spoken by the barbarous tribes of N. and N. Central Europe. Belonging to the W. group of Indo-European languages, and intermediate between the Baltic and Italo-Celtic divisions, it developed three main dialects, aided by the formation of political and military confederations. These were: (1) E. Teutonic, comprising Gothic (*q.v.*), Vandalic, and Burgundian, all extinct; (2) N. Teutonic or Norse, comprising Icelandic, Swedish, and Dano-Norwegian; (3) W. Teutonic, including the Low German tongues, Old Saxon, and Old Frisian, the Anglo-Frisian group, intermediate between W. and N. Teutonic, and the High German group. From Old Saxon developed the modern Low German or *Plattdeutsch*; from Old Frisian, Dutch, Flemish, and certain German dialects; and from High German the modern literary German, which, however, contains elements from various dialects. Apart from a few Scandinavian inscriptions, the oldest Teutonic documents are the Gothic Bible, etc., of *Uphilas*, and the earliest Anglo-Saxon poems.

The chief characteristics of the Teutonic dialects are the sound-shiftings known as *Grimm's* and *Verner's laws* (*q.v.*), the development of the weak and strong adjectival forms and of the *terite* of weak verbs. Like other Indo-European languages, the Teutonic are inflexional, but have not escaped the general analytic tendency of most European dialects; this can be seen in Dutch and kindred languages, especially in English. See Europe; Language; Pronunciation.

Teutonic Order. Order of knighthood established in 1198. Originating in the charity of some German merchants who established a hospital during the siege of Acre, 1190, it was formally constituted in Jerusalem, 1198. Membership was confined to Germans of noble birth. Although its headquarters for a century (1191-1291) were at Acre, the order carried out its greatest work in Germany, where it undertook the conversion and conquest of Old Prussia.

Acquiring political importance, the order ruled large districts on the borders of Poland and Russia, owing allegiance to no power save the pope. Its seat was moved to Marienburg in 1308, and for another hundred years the grand masters there held court and ruled extensive territories. By its constitution of knights, priests, and servants, every function of the state government, civil and ecclesiastical, was provided for, and the order had become one of the most flourishing institutions of Europe when it was defeated by the Polish king Ladislas at Tannenberg, 1410.

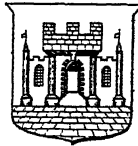
This gave its subjects a chance of revolt. The Prussian League was formed in 1440, and in 1466 it helped Poland to wrest West Prussia from the knights by the treaty of Thorn. By this treaty the order held East Prussia as vassal of Poland, and half the knights were to be Poles. For another 60 years the order remained in this state of vassalage until, in 1526, its grand master Albert of Brandenburg became a Protestant and made the territories an hereditary grand duchy. The order continued to exist, with headquarters at Mergentheim, until 1809. It was revived as an Austrian order of knighthood in 1834. See Knighthood; Prussia.

Teviot. River of Scotland, in Roxburghshire (*q.v.*). It rises near the co. boundary and flows N.E. to join the Tweed near Kelso after a course of 37 m. There are fisheries for salmon and trout. The valley is known as Teviotdale.

Tewfik Pasha (1852-92). A khedive of Egypt. Son of Ismail Pasha, he was born Nov. 15, 1852, and in 1879 succeeded his father, who had been deposed, as ruler. The confusion into which Ismail's policy and extravagance had thrown the

country necessitated the intervention of Great Britain and France, and foreign influence occasioned the rising in 1882 of Arabi Pasha (*q.v.*). Tewfik's reign was marked by reliance on the advice of Baring (later Lord Cromer), and in 1884 he evacuated the Sudan. He died Jan. 7, 1892.

Tewkesbury. Mun. bor. and market town of Gloucestershire, England. Situated at the confluence of the Severn and Avon, near the Worcestershire border and 10 m. N. of Gloucester, it has a rly. station. Founded by the Romans, who named it Etocesa, Tewkesbury has always been locally important for its abbey, founded in 1102 on the ruins of an 8th century Benedictine establishment. The church alone survived



Tewkesbury arms

defeat at Barnet, Margaret, queen of Henry VI, joined the Lancastrian forces in the W., and, excluded from Gloucester, encamped on the slopes S. of Tewkesbury in a strong position with the little river Swillgate on the left. The duke of Somerset commanded the exhausted army. He was rash enough to abandon his strong defensive line to come down into the plain, and when the Yorkists, under Edward IV, who had followed rapidly from Cirencester, opened fight, the Lancastrians were routed and their cause was lost. Prince Edward fell, and Margaret was captured.

Texarkana. Name of a city of the U.S.A. It lies across the Texas-Arkansas border, and has two separate municipal govts., but forms a commercial, industrial, and social unit. Situated 165 m. N.E. of Dallas, Tex., 165 m. S.W. of Little Rock, Ark., 26 m. S. of the border with Oklahoma, and



Tewkesbury, Gloucestershire. Air view of the church of the old Abbey, a magnificent example of Norman architecture

the Reformation; this remains one of the finest Norman edifices in England. The central tower, N. porch, and W. front are perfect examples of the style. Other buildings of interest are the grammar school, founded 1576; town hall, corn exchange, and Tolsey Hall. There are many fine old houses in the town, which figures as Nortonbury in John Halifax, Gentleman. Dickens brought Pickwick to dine at the Hop Pole. The district was long noted for making mustard; Falstaff said of Poins, "His wit's as thick as Tewkesbury mustard." Market days, Wed. and Sat. Pop. 4,667.

Tewkesbury, BATTLE OF. Fought May 4, 1471, during the Wars of the Roses (*q.v.*). After her

28 m. N. of the border with Louisiana, Texarkana has a municipal airport and is served by the Missouri Pacific and other rlys. Situated in an agricultural and lumbering region, the city ships cotton and cotton products, garden produce, grain, and lumber. Industrial establishments include rly. repair shops, planing mills, cotton and cotton-seed-oil plants, and textile mills.

The first permanent settlement was made in 1874; the Texas half of the city was incorporated in 1875, the Arkansas half in 1881. Pop. (1940) 28,840—17,019 in Tex. and 11,821 in Ark.

Texas. Largest state of the U.S.A. Approx. one-twelfth of the entire area of the Union, Texas has



Tewfik Pasha, Khedive of Egypt

some characteristics of the west, the south, and the central regions of that country. One of three states (the others being Vermont and Calif.) to have been an independent republic under its own flag before its entry into the Union, it has the unique distinction of having entered on its own terms and by a joint resolution of the U.S. congress.

In area 263,644 sq. m., Texas is considerably larger than France, Belgium, the Netherlands, and Switzerland combined; and than the six New England states with N.Y., N.J., Penn., Del., Md., Va., and W. Va. Its 254 cos. include 59 as large as, or larger than, Rhode Island, the smallest state. Texas ranks sixth among the states in pop.: (1945, est.) 6,786,740.

Plains, Prairies, and Mountains

Physiographically, Texas can be divided into four areas—the flat, alluvial coast-belt of the gulf plains in the S.E.; the prairies stretching W. to the 100th meridian; the great plains, an elevated plateau from 1,000 ft. to 5,000 ft. high; and in the extreme W., the Basin range, or Trans-Pecos prov., a mountainous region containing many peaks more than 5,000 ft. high, the highest point in the state being El Capitan (9,020 ft.), a peak in the Guadalupe mts.

A series of low, sandy islands lies along the coast. The Panhandle, the N. tip of Texas, is so called because on the map it looks like the handle of a huge pan. The Rio Grande, which separates Texas from Mexico, and the Pecos and Canadian rivers rise in the Rockies in Colo. and N.M. The other principal streams, all rising within the state, are the Red, forming part of the boundary with Okla., the Sabine, part of the boundary with La., the Colorado, the Brazos, the Guadalupe, the Trinity, and the Nueces. Their waters have formed many deep canyons.

The climate ranges from subtropical to temperate. Irrigation is extensive and has been responsible for the development of the "magic valley" in the lower Rio Grande region and for Texas ranking as the third citrus-fruit producer among the states. The huge earthen Denison (Lake Texoma) dam, on the Red river, 5 m. N.W. of Denison, was built to control floods and provide hydroelectric power.

Texas produces one-fourth of the cotton of the U.S.A., and one-seventh of the world's cotton. Among its other chief crops are maize, winter wheat, rice, pota-

toes, peanuts, tomatoes, onions, and fruit. Livestock, particularly beef cattle, sheep, goats, and mules, wool and mohair are other agricultural products. Texas is also the centre of U.S. petroleum production, 200 cos. having deposits (the E. Texas oilfield is the richest known), and ranks first in natural gas (its gas pipelines serve several other states). Almost all U.S., and 85 p.c. of the world's, sulphur, virtually all U.S. helium (controlled by the U.S. govt.), and one-fourth of U.S. mercury come from Texas. Asphalt, magnesium, clay, cement, and other mineral products are produced in great quantity. The state has also immense little-developed deposits of iron, bituminous and sub-bituminous coal, and lignite. The forests, about 50,000 sq. m. in extent, yield yellow pine and oak.

The industries are chiefly those derived from or supporting the exploitation of the state's natural wealth—petroleum-refining, slaughtering and meat-packing, processing of non-ferrous metals, and production of cotton, cottonseed oil, flour, feed, and grains, and oilfield machinery. Other industries, including aircraft and chemical production, were established during the Second Great War. Important ports are Houston, Beaumont, Texas City, Corpus Christi, Port Aransas, and Galveston. Cities of more than 50,000 pop. are, besides Houston, Dallas, San Antonio, Fort Worth, Austin (the capital), Beaumont, Corpus Christi, Amarillo, El Paso, Galveston, and Waco.

Texas has 84 institutions of higher education, including the state university of Texas at Austin. The state has a large Mexican and negro pop. Spanish is still spoken in the S.W., where the influence of the first (Spanish) settlers is strong. An international park consisting of land contributed by Texas and Mexico, along the Rio Grande, was projected in 1948. Two senators and 21 representatives are returned to congress.

Texas has existed under six flags, those of Spain, France, Mexico, the republic of Texas, the U.S.A., and the Confederacy. It was settled in the 17th cent., taking its name from an Indian term, *tejas*, meaning friends or allies, which was applied to the Indian tribes around the Spanish missions in E. Texas. When Mexico declared its independence in 1821, Texas was a part of it.

Following trouble with the tyrannical govt., in 1835, a move-

ment for independence made headway in Texas, where many Americans and Britons had settled. War ensued, the end being a declaration of Texan independence in 1836. Outstanding events of the war were the heroic stand at the Alamo, a Spanish mission in San Antonio, by 187 Texans who were vanquished by a force of 3,000 Mexicans and slaughtered to a man, and the battle of San Jacinto, 18 m. from the present Houston, six weeks later, where the Texans under Gen. Sam Houston defeated the Mexicans and captured their leader, Santa Anna. The Alamo became a hallowed shrine, and on the San Jacinto battlefield is a monument consisting of a 570'4-ft. shaft, with a museum at its base. Texas was a republic for 9 years and 301 days until in 1845 it entered the Union. Disputes over the boundary between the new state and Mexico led to war with Mexico, 1845-48 (see Mexico). Texas was not a Civil War battlefield, although the last engagement was fought on the Rio Grande, near Palo Alto, a month after the surrender at Appomattox.

Texas City. Port of Texas, U.S.A. It lies on the W. side of Galveston Bay, 4½ m. N.W. of Galveston by rly. With a pop. of 350 in 1900, 5,748 in 1940, 25,000 in 1947, in 1945 it ranked 13th among U.S. ports in volume of trade (8,696,711 short tons), five above San Francisco (7,530,007 short tons). Here in 1947 the French Liberty ship, the 7,176-ton Grandcamp, loaded with nitrates, caught fire and blew up, April 16. Explosions ashore, in a large chemical works and among oil tanks, followed; fires raged for 24 hours, the 6,214-ton High Flyer, loaded with nitrates and sulphur, and smaller ships and barges also blowing up. The waterfront was burnt out, houses up to two miles away were wrecked, and the explosions were felt 100 m. inland. Casualties included 512 killed and 3,000 injured. It was the worst disaster of the kind that had been experienced in the U.S.A.

Texcoco or **TEZCUCO.** Town of Mexico, in the state of Mexico. It stands on the E. shore of the salt lake of Texcoco, 24 m. by rly. E. by N. of Mexico City. Until the Spanish conquest it was the capital of a flourishing kingdom, allied with Mexico.

Texel. Island of the Netherlands in the prov. of N. Holland. The most westerly of the Frisian Islands (*q.v.*), it is separated from the mainland by the Marsdiep

channel. The surface is flat and often marshy. To the N. of the island is the dist. called the Eijerland, or Land of Eggs, where seabirds' eggs are collected in large numbers. Den Burg is the chief town. Off Texel the English fleet, under Monk, defeated Tromp, July 31, 1653. Its area is 71 sq. m. Pop. 7,620.

Textile (Lat. *texere*, to weave). Term for any woven material. The art of preparing and using various materials to produce cloth was already practised thousands of years ago, by the Chinese, the Sumerians, and the Egyptians. Textile manufacture ranks with agriculture, house-building, cooking, and metal-working as one of the basic activities of civilized man. From the 11th cent. to the 14th raw wool was England's chief export; from the 15th cent. to the 17th cloth made of wool was more important, impetus being given to the industry by waves of immigrants from the Continent who brought Continental processes with them. In woollen manufacture factories first developed, and the state regulation of industry began. The earliest craft guild was that of the weavers.

From the 17th cent. cotton gradually became more important than wool, both in the manufactures and in the foreign trade of England, and the inventions that led to the Industrial Revolution, and transformed industry from the domestic to the factory system, concerned cotton spinning and weaving. The new inventions were adopted in the wool industry also, though more slowly, and together these two textile industries accounted for much of the expansion of British foreign trade during the 19th cent.; and their prosperity was an important factor in the doubling of the pop. between 1750 and 1831 and later increases.

At the beginning of the 20th cent. textiles constituted almost 50 p.c. of British exports. They employed about 1.5 millions of the 16 millions of industrial workers. Cotton still predominated; "Manchester goods" were part of the idiom of world trade. But Japan became an important competitor in Great Britain's cotton markets in the Far East, India, and Africa; Indian companies, some financed by British capital, supplied much of the local demand. Artificial silk (rayon) began to replace cotton and caused considerable changes in textile fashions and textile technology. After the First Great War the cotton industry was never able

to export either in such volume or to such a value as formerly. The wool industry became relatively more important, although it also declined, principally because of the growth of manufacture overseas. In the third decade of the century unemployment in most branches of textiles was very heavy, almost one in five being unemployed. The value of the output of textiles shrank from £763 m. in 1924 to £446 m. in 1935.

During the Second Great War, as part of the policy of "concentration of industry," the number of those employed in textiles was deliberately reduced from 1,183,000 in 1939 to 661,000 in 1945.



W. M. Thackeray.

After Samuel Laurence

At the end of the war there was an immense and urgent need for textiles of all kinds at home and abroad. Japan was, for the moment at any rate, no longer a supplier of cheap cotton and rayon goods, and much of the textile manufacturing capacity of the Continent had been destroyed or disorganized. A determined effort was made to restore the textile industry in the U.K., but at the beginning of 1947 production of cotton was still 40 p.c. below that of 1939; the labour force numbered only 255,000 compared with 344,000. The consumption of wool was 80 p.c. of that in 1939, the number engaged in the industry 167,000 compared with 210,000. Rayon yarn output, however, was more than 50 p.c. above pre-war.

The Americas, Australia, New Zealand, and South Africa came, as the 20th cent. progressed, to produce more and more of the textiles they required—a huge cotton, wool, and silk manufacturing industry, greatly developed to supplywar needs, grew up in the

U.S.A.; the countries of S. America, deprived twice by war conditions for years at a time of their normal imports of textiles from Europe, began to set up their own textile factories. The nations of the British Commonwealth did likewise. But in spite of this there remained a world demand for the fine quality textiles of the U.K., particularly cottons and woollens, which in the second quarter of 1948 represented £53 m. out of a total export of manufactured goods valued at £337 m. See Cotton; Jute; Rayon; Silk; Wool.

Thackeray, WILLIAM MAKEPEACE (1811–63). British novelist, humorist, and essayist. He was born at Calcutta, July 18, 1811, and was sent to England six years later. He was at Charterhouse from 1822, and in 1829 went to Trinity College, Cambridge, where among his contemporaries were Tennyson, FitzGerald, and Monckton Milnes, with all of whom he formed enduring friendships. He left the university in 1830, without taking a degree, and went to Weimar. In 1831 he entered the Middle Temple, but abandoned law for journalism. He purchased in 1833 *The National Standard*, which he edited for the few months it survived, and in 1836 went to Paris as correspondent for the short-lived *Constitutional*. That year he married Isabella Shawe (d. 1894); there were three children, including Lady Ritchie. In 1840 Mrs. Thackeray's brain gave way, and she never recovered. Thackeray now became a confirmed clubman, his favourite haunt being the Garrick.

He had long been on the staff of *Fraser's Magazine*, to which he contributed stories, essays, verses, caricatures, art criticism, and reviews. His principal contributions were *The Yellowplush Papers*, 1837–38, which attracted attention, and was pirated in the U.S.A.; *Major Gahagan*, 1838; *Catherine, A Shabby-Genteel Story*, 1840; *The Great Hoggarty Diamond*, 1841; *The Fitzboodle Papers*, 1842; and *Barry Lyndon*, 1844. *The Paris Sketch Book*, 1840, and *Comic Tales and Sketches*, 1841, were volumes of articles already published, but *The Second Funeral of Napoleon*, and *The Irish Sketch Book*, 1843, contained new matter. Thackeray first became known to a wider public by his contributions to *Punch*, *Jeames's Diary*, 1845, *The Snobs of England*, 1846–47.

Fame in the broader sense came with the issue of *Vanity Fair* in monthly parts during 1847–48.

He was then recognized as one of the great men of letters of the day, at least the equal of Dickens. *Pendennis* appeared 1848–50, and *Esmond*, which set the seal upon his reputation, was published in three vols. in 1852. *The Christmas Books*, Mrs. Perkins's Ball, 1847, *Dr. Birch*, 1849, *The Kickleburys on the Rhine*, and *Rebecca and Rowena*, 1850, showed versatility.

In 1852 Thackeray went to the U.S.A. to deliver lectures on *The English Humorists of the 18th Century*, which he had already given in England. On his return he published *The Newcomes*, 1853–55. In 1855, in which year was issued that splendid example of delightful fooling, *The Rose and the Ring*, he went again to America to lecture on *The Four Georges*, which series he presently gave in London and the provinces. He stood unsuccessfully for Oxford in the Liberal interest in 1857. He then went to his desk again, and wrote *The Virginians*, 1857–59. *The Cornhill Magazine* was founded in 1860, and Thackeray edited the first 28 numbers. He contributed to it *Lovel the Widower*, 1860, *Philip*, 1861–62, and many delightful *Roundabout Papers*, 1860–63. The fragment, *Denis Duval*, appeared posthumously in 1864, Thackeray having died on Christmas Eve, 1863.

Thackeray was one of the most versatile of writers. His light verse is often delightful, and *The Ballad of Bouillabaisse* and *The Mahogany Tree* retain their popularity. His humorous writings make agreeable reading, and his parodies, notably those of *Lever* and *Disraeli*, are among the best in the language. *The Roundabout Papers* are deliciously mature. Thackeray's fame, however, rests ultimately on his novels, especially *Barry Lyndon*, *Vanity Fair*, and *Esmond*, of which the first is an admirably sustained piece of irony, excelled only by *Swift*.

It is in atmosphere and characterisation that these books are pre-eminent; when writing them Thackeray lived in the period, and with his characters, who to him were living persons. The books are somewhat lacking in plot, except *Esmond*, and what story there is is frequently interrupted by the author in his favourite rôle of week-day preacher. Thackeray's humour is strongly tinged with satire, he has a keen sense of the frailties of humanity, but though occasionally bitter is never really cynical, and is a sentimentalist at heart. His style is simple, but no

situation ever found him wanting. He nearly always furnished sketches for his books, and as an illustrator he is admirable. See *English Literature*; *Esmond*; *Novel*; *Sharp*, *Becky*; *Steyne*, *Marquis of*; *Vanity Fair*.

Lewis Melville
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Thaddæus. Alternative name for the disciple of Christ, mentioned only in John 14, as Judas "not Iscariot."

Thai. People of Mongoloid stock in the Indo-Chinese peninsula. Emanating from S.W. China, they descended the Indo-Chinese river valleys, driving the Mon-Khmer peoples before them. They include the Burma Shans, one million; the Assam Ahom; the Siamese and Lao of Siam, 7,500,000; the Lao of French Indo-China, with the Thai-speaking aboriginal Tho and Muong of Tongking; and some millions in S.W. China.

Thailand. Anglicised form of the name applied to their country by the people of Siam (*q.v.*).

Thais. An Athenian courtesan (4th cent. B.C.). She is said to have accompanied Alexander the Great on his Eastern campaigns, and to have persuaded him, during a drunken bout, to set fire to the old palace of the Persians at Persepolis, by way of reprisal for the destruction of Athens by Xerxes. Dryden's ode, *Alexander's Feast*, 1697, describes the event, which is probably unauthentic. *Thais* is also the chief character in a novel of the same name by Anatole France.

Thakin Nu (b. 1906). Burmese politician. Born at Wakewa and educated at Rangoon, with his friend U Aung San he developed a



Thakin Nu,
Burmese politician

strong nationalist bent, and staged a students' strike. He was imprisoned in 1940 for seditious activities, but was released by the Japanese invaders in

1942 and made foreign minister in the puppet government. In 1945, on the advance of British forces, he followed Aung San in changing sides, and helped to form the anti-fascist people's freedom league against the Japanese. After the war the govt. formed by this party was accepted by the British as the provisional govt. On the assassination of Aung San, July 19, 1947, Thakin Nu took over leadership of the executive council and the presidency of the A.F.P.F.L., and visited London on a "goodwill" mission to sign the treaty which granted independence to Burma. As first premier of the Union of Burma, following a "Marxist-Leninist" policy, he had to contend with violent political disunity. More than once he announced a date for his resignation, but postponed it as often in the endeavour to gain control of a deteriorating situation.

Thalben-Ball. GEORGE THOMAS (b. 1896). British organist. Born at Sydney, N.S.W., he came to London to study at the R.C.M. Having played the organ at Whitefield's Tabernacle, 1911–14, and Paddington parish church, 1916–19, he was appointed organist to the Temple church and the Albert Hall. He was an examiner and council member of the R.C.M. and R.C.O., and from 1941 on the advisory staff of the B.B.C., as well as being a leading broadcast performer.

Thaler. German silver coin first struck at Joachimsthal, Bohemia, about 1519. The coin was current in Germany until the 19th century, and was the unit of the monetary union until 1873, when it was replaced by the mark. The thaler was divided into 30 silbergroschen of 12 pfennigs. The word dollar is a modern corruption of the word.

Thalés (c. 640–c. 550 B.C.). Greek philosopher, one of the seven wise men of ancient Greece. Born in Miletus, Asia Minor, and supposed to be of Phoenician descent, he was the first human being, so far as is known, to suggest a scientific as opposed to a mythological explanation of the universe. With him the history of speculative thought begins. Thalés held that water was the all-pervading principle of the universe, and that all material substances were variants of water. He also held that the universe is a living creature. Thalés is regarded as the pioneer in the

sciences of geometry and astronomy among the Greeks, and is credited with having foretold the eclipse of the sun which occurred in 585 B.C.

Thalia. In Greek mythology, one of the nine Muses, whose province was pastoral poetry and comedy. See Muses.

Thallium (Gr. *thallos*, green shoot). One of the chemical elements. Its symbol is Tl; atomic number 81; atomic weight 204.39; density, 11.9 gm per c.c.; melting point 302.5° C.; boiling point 1,457° C. It may occur in either cubic close packing or hexagonal close packing structures. Thallium was discovered spectroscopically in 1861 by Crookes while examining some selenium residues. It owes its name to the fact that its spectrum gives one bright green line. It occurs mostly in amounts ranging from 16 to 60 p.p.m. in a few rare minerals like crookesite; also in pyrite, marcasite, and lepidolite. From ores by acid extraction, or from flue dusts by extraction with water, it may be readily prepared, as also from its compounds by electrolysis or by precipitation with zinc. Thallium is a white metal with a blue tint; so soft that it may be marked with the finger-nail, and leaves a black spot on paper.

Two series of salts are formed, corresponding with the valencies of one and three, and these show many resemblances to those of near neighbours of thallium in the periodic table. The trivalent salts bear the closest resemblance to iron and aluminium. Although oxidation is slight at ordinary temperatures, thallic oxide is easily formed above 100° C., and at higher temperatures thallic

oxide. Soluble thallium salts are poisonous and will destroy pests. Adding thallic oxide to glass gives it a high refractive index, making it suitable for artificial gems. The oxysulphide is used in photo-electric cells.

Thallophyta. Division of plant-life which includes the two subdivisions, the algae and the fungi. See Algae; Fungus.

Thälmann, ERNST (1886-1944). German communist. As a youth engaged in transport work in Hamburg, where he was born April 16, 1886, he joined the Socialist party. A revulsion against the First Great War, in which he served, carried him over to its independent wing, and from 1920 he was a vigorous communist. In the Reichstag from 1924, he twice stood against Hindenburg for the presidency. As chairman of the German Communist party he was made an honorary member of the Moscow International. Immediately Hitler came to power Thälmann was interned at Buchenwald concentration camp. He certainly died there in 1944: the Nazis said he was killed by Allied bombs on Sept. 16 (when no enemy aircraft was near), but inmates of the camp later averred he had been shot by guards on Aug. 18.

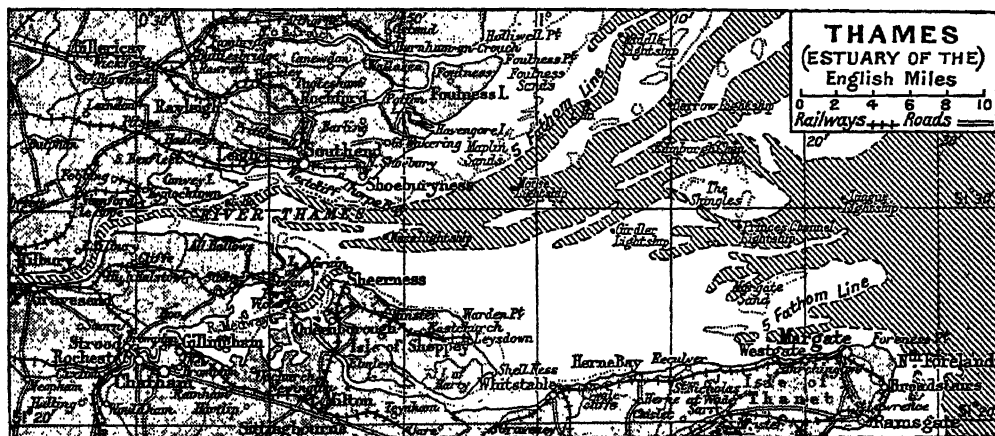
Thame. River of England. It rises in the Chiltern Hills in Hertfordshire, N.W. of Tring, and flows generally S.W. through the Vale of Aylesbury, Bucks, then S. through Oxfordshire to the Thames, which it enters near Dorchester. Its length is c. 30 m. Thame is the largest place on it.

Thame. Market town and urban district of Oxfordshire, England. It stands on the Thame, 12 m. E. of Oxford, and is con-

nected therewith by rly. and bus. The chief building is the church of S. Mary the Virgin, a large edifice mainly E.E., with remarkable tombs and other monuments. There are a town hall, and a grammar school founded by Lord Williams of Thame (d. 1559). Hampden is said to have died in a house in the town. Thame Park is a fine house standing in a large park; in its grounds are slight remains of a Cistercian abbey. Thame has an agricultural trade. There is an annual fair and agricultural show in Sept. Market day, Tues. Pop. 3,020. *Pron.* Tame.

Thames (Latin *Tamesis* or *Tamisis*). Longest and most important river of England. It rises on the E. side of the Cotswolds in four headstreams: Thames or Isis, Churn, Coln, and Leach, which unite near Lechlade. The waters of these streams and the tributaries Windrush, Evenlode, and Cherwell, accumulate at Oxford, at a gap in the Oxford heights. The main stream below Lechlade, and the Ray, a tiny affluent of the Cherwell, flow in a clay vale along a line parallel to the Oxford heights. Below Oxford, the Thames receives the Thame and leaves the Upper Thames basin through the Goring gorge. Below Reading, at the E. end of the gap, the Thames is the chief river of the London basin.

From the N., the Colne, Brent, Lea, and Roding reach the left bank; the Kennet, Loddon, Wey, Mole, Darent, and Medway flow in on the right bank from the S. So deeply has the Thames gouged out the Tertiary strata that at Cricklade it is little more than 250 ft. above sea level; it is 200 ft. at a point 119 m. from London Bridge,



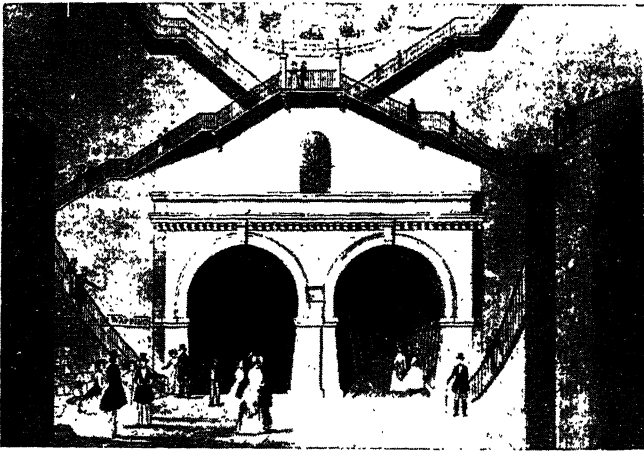
Thames. Map of the estuary of the Thames below Tilbury, showing the many shallows which make navigation difficult

England. Part of the urban dist. of Esher, it is reached by electric rly. from London, 14 m. to N.E. Anglers frequent it, and there are numerous houseboats. The ancient church of S. Nicholas shows interesting brasses and monuments, and there are almshouses dating from 1720. Pop. 10,080. *See* Esher.

Thames Embankment. Wall of granite, with plane tree bordered footway, built in three sections along the banks of the Thames, 1864-74. The embankment was begun, by the metropolitan board of works, with the Victoria Embankment on the left bank of the river between Blackfriars and Westminster. It was completed in 1870, under the supervision of Sir Joseph Bazalgette, at a cost of £1,553,000. Extending for 1½ m., it includes a granite river wall 8 ft. thick, with foundations 16-30 ft.

wide, and is 4,300 ft. in length. A river wall, 1,700 ft. long, between County Hall and Waterloo bridge constructed 1949-51, bounding the Festival of Britain buildings, reclaimed 4½ acres from the river.

Thames Tunnels. There are several tunnels under the Thames in the London area. The first, Wapping to Rotherhithe, was projected by Sir M. I. Brunel, begun 1825, opened for foot passengers 1843, and cost £600,000. An inundation caused a suspension of the work of construction for seven years ending in 1835. Sold in 1865 to the East London rly. co. for £200,000, and since used for rly. purposes, it has sloping approaches and included two arched passages, 1,200 ft. long, 14 ft. wide, and 16½ ft. high. The crown of the tunnel is about 16 ft. below the river bed.



Thames Tunnels. Wapping end of the first tunnel, shortly after its opening by its designer, Sir Marc Isambard Brunel, March 25, 1843

From a contemporary print

below low-water mark, landing-stages, a roadway 100 ft. wide, with a separate road for trams, a footway, and public gardens. Under the footway are a low-level sewer, water and gas mains, and telegraph wires; under the roadway runs the underground rly., with the stations Westminster, Charing Cross (formerly called Embankment), and Temple. The Chelsea Embankment, about 1 m. in length, extends from Battersea Bridge to Chelsea Bridge, on the left bank of the river, and was made during 1868-74 at a cost of £250,000.

The Albert Embankment, on the right bank of the river, between Westminster Bridge and Vauxhall, was constructed on similar lines, during 1866-69, cost a little over £1,000,000, has a roadway 60 ft.

Other tunnels are used by foot and vehicular traffic. One goes from Rotherhithe on the Surrey side to Commercial Road, and another is the Blackwall tunnel (*qv.*). One between Greenwich and Poplar and another between the two parts of Woolwich are for foot passengers only.

Thana. District and town of the N. division, Bombay state, India, on the island of Salsette, to which (over a causeway) the rly. line passes from Bombay I., between Sion and Kurla. The dist. fringes the coast N. of Bombay; it has an annual rainfall of 100 ins. Rice is the chief crop. The town is 2 m. from Bombay and was the terminus of the first stretch of rly. opened in India. In earlier times the capital of a large kingdom, it was visited by

Marco Polo in 1298, and in the 16th century became a Portuguese settlement. By 1739, when it was taken from the Portuguese by the Mahrattas, the settlement was highly cultivated. In 1775 the British forestalled a Portuguese attempt to recapture it by taking it after a three-day siege. On March 6 1775, it was ceded with the island of Salsette to Great Britain by the treaty of Surat. The English church here was consecrated by Bishop Heber in 1825. In the 16th century the silk industry employed 6,000 people; it is now confined to one family. Area 3,526 sq. m. Pop., dist., 932,733; town, 23,000.

Thane or **THENG.** Name given in Anglo-Saxon England to a class of soldiers and landholders. The earliest thanes seem to have been the retainers or military followers of a king or other ruler, but after a time they appeared as holders of land also. As a class, they stood between the earl and the ceorl with a wergild (*qv.*) six times that of the latter. There were various classes of thanes; king's thanes with special privileges, bishop's thanes, and others. In course of time the word changed its meaning somewhat, but it always retained the idea of military service, which was often rewarded or purchased by grants of land. The rank of thane could also be attained by a successful man of lower degree. After the Norman Conquest the word disappeared in England, but in Scotland it remained some centuries longer to describe a certain class of royal tenants. In England the knights were the successors of the thanes.

Thanet. District and co. constituency of Kent, England. In the N.E. of the county, the "isle" of Thanet is about 9 m. long by 5 m. wide, and is separated from the rest of Kent by the Stour. This is the successor of a much larger river, the Wantsume, which was said to be a mile wide and which made Thanet an island. The Romans built Richborough and Reculver to guard the river crossings. Noted for its bracing climate, it is washed on three sides by the sea, and on it stand Margate, Ramsgate, Westgate, and Broadstairs. It contains also the N. Foreland, while inland are St. Peter's and Minster. On the island too is Ebbsfleet, the supposed landing-place of Hengist and Horsa, and later of S. Augustine. The district has other associations with the earliest days of English history.

Thanet Beds OR THANET SANDS. Name given by geologists to the lowest division of the Eocene in Great Britain. They consist of yellow to greenish sands, well developed in the Isle of Thanet, and contain a large number of marine fossils. See Geology.

Thanksgiving Day. National holiday in the U.S.A., annually proclaimed by the president and state governors for general thanksgiving. Religious services are held, and in New England especially the day is the great family festival, like the English Christmas. It was first celebrated in 1621, when the Plymouth colony appointed a day for thanksgiving after their first harvest, and celebration of a day of thanksgiving soon became general. Its observance as a national festival is said to have been suggested by Sarah Josepha Hale (1790-1879). In 1863 Lincoln proclaimed the fourth or last Thurs. in Nov. a day of national thanksgiving and a general holiday. In 1941 F. D. Roosevelt fixed the day as the fourth Thurs. in Nov.

Thann. Town of France, in the dept. of Haut-Rhin. It stands on the Thur, 22 m. S.S.W. of Colmar, and was an apanage of the house of Hapsburg in 1624, being frequently exposed to hostile attacks during the Thirty Years' War. Stormed by the Swedes in 1632, it was subsequently captured by the duke of Weimar and retaken by Austrian troops, only to fall at last into the hands of the French under Turenne, by whose orders the fortress castle of Engelburg was demolished. The fine 15th century church of S. Theobald has survived the ravages of war. Noted for its white wine, Thann has textile factories, machine shops, and chemical works. Pop. est. 7,500.

Thapsacus. Commercial city of ancient Syria. On the right bank of the Euphrates, it has been identified with the Tiphisah (Semitic, crossing) of the O.T. (1 Kings 4, v. 24), and formed the northern limit of Solomon's kingdom. From the earliest times it was the chief crossing-place of the river, and was used as such by Cyrus and the Ten Thousand, Darius Codomannus, and Alexander. Called by the Macedonians Amphipolis, the site is probably near Debsi.

Thapsus. Peninsula on the E. coast of Sicily, now known as Magnisi. In their attack on Syracuse, 414 B.C., the Athenians used it as a naval base. Tombs have been found containing Sicel objects (see Sicily) of the 10th or 11th century B.C. Salt works are situated here.

Another Thapsus, an ancient town of Africa, on the Mediterranean Sea, 100 m. S.E. of Carthage, was the scene of a defeat of the Pompeians by Caesar in 46 B.C.

Thar Desert. Arid region of the Indian sub-continent. It lies E. of the Indus valley, N.W. of the Aravalli Hills, and is a portion of the Indo-Gangetic plain, extending on its W. into Pakistan. The S.W. monsoon, loaded with water, blows across the heated surface, but deposits no rain until it reaches the Himalayas.

Thar Pärkar. Most easterly dist. of Sind, Pakistan. It includes, in the N., the S. portion of the Thar desert, and is the most scantily peopled dist. in the province. The rainfall is less than 10 ins. and nearly half the tilled area is irrigated. The crops are mostly food grains. Area, 13,649 sq. m. Pop. approx. 581,000.

Tharaud. Name of two brothers, French novelists. Jérôme was born on May 18, 1874, and Jean on May 9, 1877, both at St. Junien, Haute-Vienne. Working and living together at Versailles, they won the Goncourt prize in 1906 and in 1920 the grand prix of the Academy, to which both were elected—the younger in 1938, Jérôme in 1946. Their huge output, mainly fiction, began with *Le Coltineur Débile*, 1899. There are psychological novels such as *Dingley*, 1902; *L'Ami de l'Ordre*, 1905; *Les Bienaimées*, 1932; others dealing with the Jewish problem, e.g. *L'Ombre de la Croix*, 1917; *Le Royaume de Dieu*, 1920; *Quand Israël N'est Plus Roi*, 1933; travel books, such as *Les Moines de l'Athos*, 1904; *La Bataille de Scutari*, 1926; and biographies, e.g. of *Déroulède*, 1924; *Notre Cher Péguy*, 1926. Jérôme, who during 1905-14 was secretary to Barrès, wrote without his brother Mes *Années chez Barrès*, 1928;

otherwise their respective work is indistinguishable. *Pron.* Tah-ro.

Tharawadi. Dist. and town of Lower Burma. The dist. occupies the S. portion of the Pegu Range E. of the Irawadi. Rice is the only crop. The town is on the Prome-Rangoon rly and main road, 68 m. N.N.W. of Rangoon. Area, 2,863 sq. m. Pop., dist., 593,909; town, 9,000.

Thasos. Greek island of the Aegean Sea. It is 4 m. from the S. coast of Thrace and 30 m. N.N.E. of Mt. Athos. The island is reputed to have been colonised by the Parians about 700 B.C. Forested mountains almost cover it. Exports are timber, wax, honey, and oil. The capital, Thasos, is on the N. coast. Area 150 sq. m.

Thatched House Club. London social club. It originated in an inn near St. James's Palace, long known as the Thatched House Tavern, which had a great dining-room, with a ceiling painted to represent the sky, where the Dilettanti Society met. The old tavern was pulled down in 1814, and a newer building in 1843, after which the Conservative Club was built on the site. The name was given to another building in the street, and in 1865 the Thatched House Club was formed. From 1950 it shared the premises of the Junior Carlton Club, its own house at 86, St. James's Street, S.W.1, being taken over by the Union club.

Thatching. Agricultural process used to protect ricks and buildings. Straw, reeds, heather, gorse, and bracken are the materials chiefly used. Of straws the best for thatching are those of wheat and rye. Oat and barley straw, being softer in texture, are liable to absorb water. Reeds are superior as a thatch to any straw; a reed roof well laid will last for half a century without repair; but reed thatching is expensive. Heather or ling is much used for thatching summer-houses and ornamental buildings. Good heather thatch has lasted a hundred years or more in sound repair, but is much heavier than other kinds.

The thatcher's outfit consists of a bill-hook, a paring knife, a large, forked stick to contain the drawn straw, and a wooden rake with iron



Thatching the roof of a cottage. The thatcher has worked up to an angle of the roof, where he is forming the ridge

teeth. He has also a supply of tarred cord and wooden pegs, usually of split hazel or willow. The straw is first well moistened, then the heap is turned with a fork and afterwards lightly trodden. The thatcher draws his straw from the bottom of the heap, taking it by double handfuls. Drawn straws are usually called yealms, and this work of drawing was formerly done by the assistant or server. The straw being made into a bundle in which the individual straws lie fairly straight, the thatcher takes this bundle and puts it into place. He begins at the bottom or eaves and works upwards, securing each successive course with his pegs and twine. In S. England split hazel rods are frequently used in place of twine. Reaching the top, the straw is laid well up to form a point, and give a good pitch. It is often necessary to use bundles of tightly-tied straw to bolster up the ridge. *See Roof.*

Thaton. Dist. and town of Burma, in the Tenasserim division. The dist. lies N.E. of the Gulf of Martaban, along the lower course of the Salween. As rainfall is 215 ins. annually, rice is the only crop.

Thaton town is on the Rangoon-Moulmein rly. some distance from the coast. Buddhist missionaries from Ceylon arrived c. 240 B.C. This was the capital of the Talain kingdom until destroyed in 1050 by Anaurata, when King Manuha and his court were carried off to build a new capital at Pagan. Area, 4,892 sq. m. Pop., dist., 592,638; town, 21,600.

Thaulow, FRITZ (1847-1906). Norwegian painter. Born Oct. 20, 1847, at Christiania (Oslo), he

studied at Copenhagen academy, under Gude at Karlsruhe, and in Paris. He returned to Norway and led the opposition to the stereotyped principles of German academic art which then prevailed in his country. He painted much Norwegian scenery, particularly effects of snow, in oils and pastel. A series of pictures of the Seine helped to assure him an international reputation, and in Great Britain he was known for remarkable colour etchings. Thaulow died Nov. 5, 1906.

Thaw. Term for the melting of ice. It is also used to indicate the break-up of a frost. In the British Isles the final disappearance of frost is generally a result of comparatively warm winds from the Atlantic replacing northerly or easterly Arctic air streams. The spring thaw is a regular feature of northerly latitudes; ice-bound seas again become open to shipping, and on land the winter snows melt. If the sun is sufficiently high in the sky and not obstructed by clouds, a partial thaw may occur at midday, even during protracted frosty spells. *See Frost; Ice.*

Thaw Case. American murder case. On the night of June 23, 1906, in New York, Harry K. Thaw, the son of a Pittsburgh millionaire, deliberately shot Stanford White, a leading architect, on the ground that he had insulted his wife. The trials lasted from



Fritz Thaulow,
Norwegian painter

Jan., 1907, until July, 1915. The case created a world-wide sensation for its revelations of life among the wealthy in New York, and for the long legal battle to save the life of the murderer, on the ground that he was insane at the time of the murder. Released on July 17, 1915, supposed to have recovered his sanity, Thaw was rearrested in 1917 and confined in a lunatic asylum for seven years. Thereafter his eccentric conduct drew attention to him. He died at Miami Beach, Florida, Feb. 22, 1947.

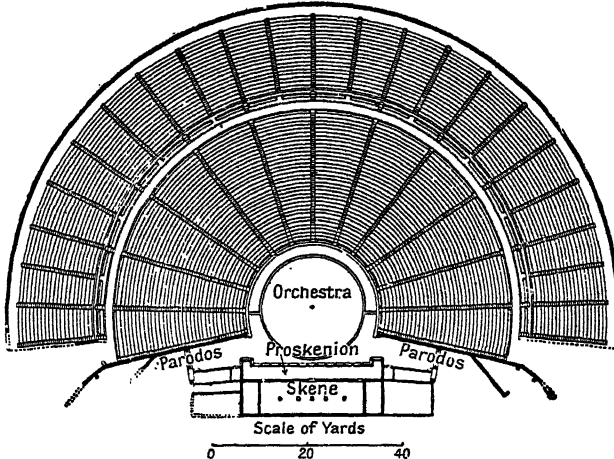
Thaxted. Village of Essex, England. It is 6 m. S. by E. of Saffron Walden, and is famous for its church, a large and beautiful Perpendicular building of the 14th and 15th centuries, with crocketed spire and notable buttresses, pulpit, and font. There is a guildhall dating from the 17th century, for Thaxted was a chartered town until 1688, having its own mayor and corporation. Samuel Purchas, the translator of Hakluyt, was born here. During the incumbency of the Rev. Conrad Noel (d. 1942) the church gained notoriety through his expression there of extreme pacifist and left-wing opinions. Pop. est. 1,600.

Thaya. River of Czechoslovakia, in Moravia. It rises S. of Iglau (Jihlava) and flows in general S.E. past Znaim (Znojmo) to join the March (Morava) after a course of 150 m. Its largest affluent is the Iglava.

Thayet-myo. Dist. and town of Burma, in the Magwe division. The dist. lies between the Arakan Mts. and the Pegu Yoma, and is crossed by the Irawadi. Rice and oilseeds are the chief products. In Japanese hands from 1942, the dist. was reconquered by the British 14th army in the last days of April, 1944. The town is a river port on the right bank of the Irawadi, 38 m. above Prome. Area, 4,750 sq. m. Pop., dist., 297,434; town, 14,000.

Theatines. R.C. religious order for men. It was founded in 1524 by Giovanni Caraffa, at that time bishop of Theate, near Naples, and afterwards Pope Paul IV, to extirpate heresy and reform the clergy.

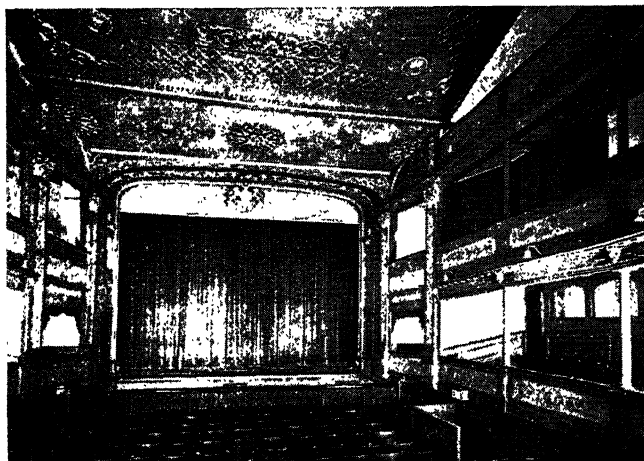
Theatre (Gr. *theatron*, from *theastai*, to look on). Place or building in which dramatic and musical performances are given. In the earliest days of the Greek drama the theatre was merely the open place where the altar of Dionysus was set up, round which the chorus revolved and was addressed by a solitary actor from his place upon a wagon. Later a



Theatre. Plan of the ancient Greek theatre at Epidaurus. The stage (proskenion) and the stage buildings (skene) were added in later times. The parados was a passage through which the chorus entered the orchestra. *See also illus. p. 3111.*

wooden building was erected, but this having been destroyed by fire, the first great stone theatre was begun in 500 B.C. within the

Megalopolis, Mantinea, Delphi, Oropus, and Delos, and there are remains of others in Asia Minor at Pergamum, Magnesia, and Priēnē.



Theatre Royal, Bristol. Auditorium of this fine example of an 18th century theatre, the oldest existing theatrical building in the U.K. See text p. 8035
Photo, Desmond Tripp

Lenaeum or enclosure sacred to Dionysus at Athens.

As finished, the theatre there was an immense semi-circular excavation in the S.E. side of the hill surmounted by the Acropolis. Round the concavity, seats for 30,000 spectators rose tier above tier, the whole topped by a balustraded portico. The lowest seats were appropriated to the priests and high officials, as being nearest to the orchestra, on the other side of which was erected the great permanent stage. Similar theatres were erected at Epidaurus, Aspendus in Pamphylia, Eretria, Sicily,

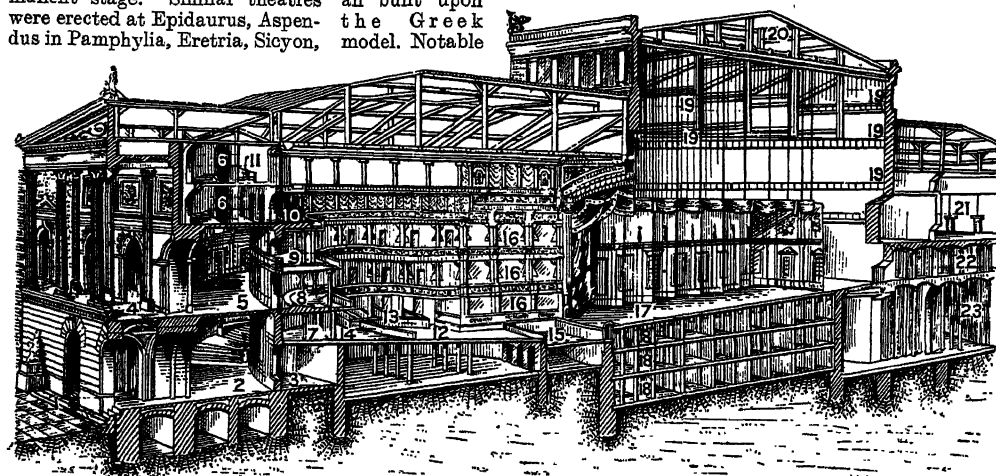
Drama was exhibited at Rome as early as 240 B.C., but permanent theatres were long prohibited as inconsistent with Roman tradition and morality, and it was not until the return of Pompey the Great from the Mithradatic war, 61 B.C., that the first stone theatre was built. The second, built by Cornelius Balbus, was opened a year or two after the battle of Actium, and the third, the theatre of Marcellus, was built by Augustus. These were the three great theatres of Rome, all built upon the Greek model. Notable

remains of Greco-Roman theatres outside the capital exist at Taormina, Syracuse, Segesta, Pompeii, and Fiesole.

The part of the theatre allotted to the actors is dealt with under Stage. The part allotted to the audience was called *cavea*, and was semi-circular with broad passages giving access to the tiers of seats rising successively above the orchestra (originally the dancing place, from Gr. *orkhēstēs*, dancer). Seats for the audiences gradually encroached upon the space originally allotted to the orchestra.

The medieval drama, consisting almost entirely of religious mysteries and miracle plays, was performed either in churches or in courtyards of inns, and no theatres were built until the end of the 16th century. One was built in Paris in 1548, others at Rome and Vicenza in 1580 and 1584 respectively. The first English playhouse was put up at Shoreditch in 1576 by Burbage, who in 1600 built at Blackfriars the first London theatre to have a roof. Meantime, in 1598, the Globe Theatre at Bankside, Southwark, had been erected, an hexagonal wooden structure partly open at the top, with three rows of balconies and a central pit without seats where the common public stood. Favoured persons were seated at the side of the stage.

Among noteworthy modern theatres may be mentioned the Paris Opera House, 1866-75; the Scala at Milan, and the San Carlo at Naples, two of the largest



1. Entrance. 2. Passage leading to pit. 3. Paybox. 4. Outside balcony. 5 and 6 Stairs to 8. 9 10, and 11. 7. Pit. 8. Dress circle. 9. First circle. 10. Balcony. 11. Gallery. 12. Stalls. 13. Boxes. 14. Pit Stalls. 15. Orchestra. 16. Stage boxes. 17. Stage. 18. Traps. 19. Gallery for stage hands to manipulate scenery. 20. Back cloth. 21. Scene painters' room. 22. Property stores. 23. Scenery stores.

Theatre. Sectional plan of a 19th century theatre showing seating accommodation in auditorium and the relatively large space occupied by the stage and its accessory departments

theatres in the world; the Court theatres of Dresden and Munich; and the immense building at Baireuth, with its fan-shaped auditorium, designed by Wagner for his own operas. A 20th century development is the revolving stage, used in large theatres. By its use two or more sets of scenery can be constructed simultaneously, and the change of scene carried out in a very short time. The leading English theatres are dealt with under their respective names.

Every building offering public performances of stage plays must be either authorised by letters patent or licensed. Patent theatres in London are Covent Garden and Drury Lane. Licenses are granted in Central London by the lord chamberlain, as they are in places where the sovereign occasionally resides. Elsewhere local authority prevails. Oxford and Cambridge universities have some control of licences for theatres within a 14-m. radius. *See* Acting; Actor; Covent Garden; Drama; Japan; Little Theatre; Repertory Theatre; Sagunto; Scala; Stage.

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Théâtre-Français. National theatre of France, officially called the Comédie Française (*q.v.*).

Theatre Royal. The two theatres of this rank in London are described in this work under their more familiar names, Drury Lane Theatre and Haymarket Theatre.

Theatre Royal, Bristol. English theatre built in 1766 in King St., Bristol. It is at least 50 years older than any other theatrical building in Great Britain. The opening play was Steele's *The Conscious Lovers*, with a prologue specially written by Garrick, who was in the audience. Garrick was almost the only great actor during 150 years not to appear there; those who did range from Kemble and Mrs. Siddons to Irving and the Vanbrugh sisters. In the early 20th century the standard of performance dropped, though highly individual pantomimes continued to be played successfully each year. In 1942 it was proposed to convert the building into a ware-

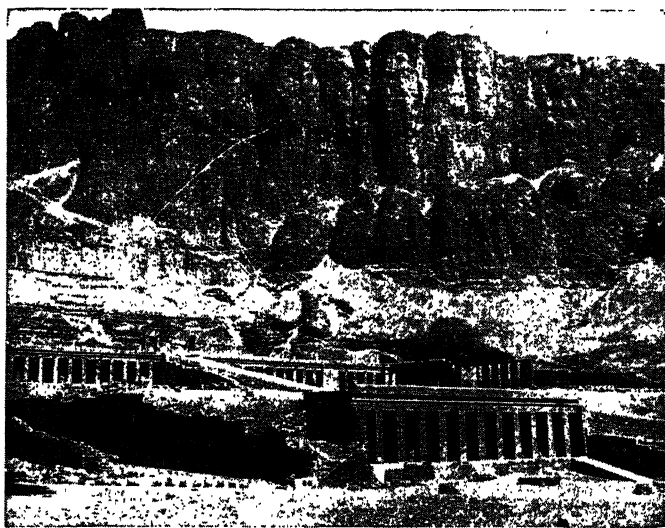
house, but a fund was raised in Bristol to buy it and it was vested in a board of trustees. The theatre was leased to the Arts Council and reopened in 1943 as England's first state-aided theatre, with an Old Vic production of *She Stoops to Conquer*. It was the headquarters of the Bristol Old Vic Company 1946-49. In 1950 the Bristol city council voted £10,000 for the repair and upkeep of the building. *See* illus. p. 8034.

Thebaine ($C_{18}H_{21}O_3N$). Alkaloid contained in opium. Usually present in proportions smaller than 1 p.c., it is more poisonous than morphine, and resembles strychnine in the results of an overdose.

Thebes. The ancient capital of Upper Egypt. It is situated on both banks of the Nile, 450 m.

preserve the tombs of queens, XVIIIth dynasty officials, and XXVth to XXVIIth dynasty functionaries, including that of Pateamonapt, 862 ft. long, the largest private tomb in the world. Near the place were two magnificent terraced temples built to hold the remains of Mentuhotep II and Queen Hatshepsut. *See* Deir el-Bahri; Karnak; Luxor; Medinet Habu; Memnon; Tutankhamen.

Thebes (Gr. *Thēbai*). City of ancient Greece. From very early times the city was the most prominent and powerful in the dist. of Boeotia. In the legendary days, it was associated with the names of Dionysus, Hercules, and Cadmus. In historic times it held no honourable place in the Greek records until the 5th century B.C.



Thebes, Egypt. Terraced temple of Deir el-Bahri, built by Queen Hatshepsut about 1500 B.C., and afterwards used for many centuries as a Coptic monastery

upstream from Cairo, and a varying region N. and S. was called the Thebaid. The Biblical No-Amon (Nahum 3), it was the centre of Amon worship. Of prehistoric foundation, it provided the XIth and XIIth dynasty kings, and after the Hyksos expulsion flourished again under the Empire. It was reputed to have a hundred gates, and its stupendous monuments record Egyptian history from the Old Kingdom to Ptolemaic times. On the W. plain are numerous funerary temples and richly appointed rock-hewn tombs. The Biban el-Moluk valley contains the tombs of XVIIIth-XXth dynasty kings; in that of Amenhotep II, Loret found in 1898 a cache of seven royal mummies, now at Cairo. Other valleys

When the Persians invaded Hellas in 480 B.C., Thebes would take no part in the Greek struggle for liberty, but yielded submission and even aid to the invader. When the Peloponnesian War broke out in 431, Thebes was in alliance with Sparta. But Sparta, after her final triumph over Athens in 404, assumed an effective domination over the states which had, in theory at least, been her equal allies.

In 379 B.C. the Thebans, under Pelopidas, ejected their Spartan masters, and entered on the struggle for independence. Thebes made up for her previous deficiencies by producing one of the most admirable characters known in Greek history, the great general Epaminondas, who led her troops

to a triumphant victory over Sparta at Leuctra in 371 B.C.

Though Thebes could not maintain her supremacy, she yet joined with Athens in resisting the conquest of Greece by Philip of Macedonia; but the allied troops were crushed at the battle of Chaeronea in 338 B.C. After Philip's death, she made one more desperate attempt at defiance and revolted against the young king Alexander the Great, thereby bringing on herself final and utter destruction in 336 B.C. Nothing was left standing except the temples of the gods and the house of the one great poet, Pindar (*q.v.*) to whom Thebes had given birth. See Greece; Sparta.

Thecla. Saint and virgin of Asia Minor. A member of a noble family, she lived in Iconium, Lycaonia, and was there converted by S. Paul. She was much persecuted for her faith, but is said to have lived to the age of 90, dying in Seleucia. She is the heroine of the 2nd century Acts of Paul and Thecla, one of the earliest Christian Apocrypha. One of the missionaries who followed Boniface (*q.v.*) is also known as S. Thecla.

Theebaw (1858-1916). King of Burma, 1878-85. Son and successor of Mindon, who had maintained friendly relations with Great Britain. Theebaw inaugurated his reign by murdering all his relations who might jeopardise his power. Bad government and neglect of obligations soon strained his relations with Britain, and war was declared, Nov. 9, 1885. An expeditionary force entered Burma and Nov. 26 Theebaw submitted, the country being annexed by Great Britain, Jan. 1, 1886. The ex-king was sent to India, where he died Dec. 16, 1916. See Burma; Mandalay.



Theebaw,
King of Burma

Theft. Compensious term which covers many forms of acquiring property dishonestly. It is properly confined to the taking of money or goods, or securities for money or goods, feloniously. The most common form of theft is the taking away of the property of another with intent to deprive him thereof.

Another form is where a person has property committed to his possession, either for safe custody or to apply it in some particular fashion

for the benefit of the owner, and, with intent to defraud, appropriates it to his own use. When a servant takes his master's property out of the master's premises (*e.g.* money out of the till) it is larceny; but where, having received money on behalf of his master, he fraudulently appropriates it, it is embezzlement. See Larceny.

Theine. Word used as a synonym for caffeine (*q.v.*), a drug prepared from the dried leaves of plants.

Theism. In the widest sense, a term denoting a belief in the existence of a Divine Being or Beings. Theism may thus include both polytheistic and pantheistic conceptions of religion. In modern usage, however, the word has acquired a much more definite connotation. It is not only restricted to monotheism, but it implies as well a certain relationship between God and the universe. In this technical sense, theism is the belief in an infinite eternal spiritual Personality who is perfect in goodness and beauty, who is immanent in the universe yet infinitely transcends it. There are only three types of pure theism in the history of religion—Judaism, Christianity, and Islam.

It used to be maintained that theism represented the primitive form of religion, and that animism and polytheism were degenerate offshoots of it. That position, however, is now almost universally abandoned in favour of the theory that theism represents the climax of a long previous evolution, including animism and polytheism.

The chief problems of theism which interest modern thought are the questions, What is the basis upon which the belief in God rests? and What is the source of our knowledge of His person and nature?

Many answers have been given to these inquiries. Some have argued that the belief in God is a rational inference from the nature of the universe and of man. These inferences have taken different forms: (a) According to the cosmological argument, the universe is inexplicable apart from the belief in a creative power. There must have been a great first cause which at any rate provided the machinery of evolution, and set it in motion.

(b) The teleological argument proceeds much upon the same lines, though it lays the emphasis not on the beginning of the process, but rather on the character of the product. The beauty and harmony of the universe could not have been the result of the fortuitous concourse of atoms, but imply the presence of a guiding and moulding hand.

(c) The existence of conscience or of the categorical imperative, in Kant's phrase, is regarded as a witness in the human heart to the existence of God. In another form the emphasis is placed, not so much upon conscience as upon the presence of a moral ideal which, it is said, can come from no other source than God. This moral argument has made a wide appeal since Kant raised it to a dominant position. (d) The ontological argument assumes that the existence of God is a necessary implicate of thought. The very fact that man has the consciousness of God in his heart is assumed to imply the need for His existence. Anselm and Descartes are the great champions of this type of reasoning, and the argument was severely criticised by Kant, who said that the presence of the idea of God in the mind no more implied His existence than the idea of ten ducats in a man's pocket implied that he would necessarily find them there.

Another modern school of thought rejects the rational arguments as too cumbrous and uncertain, and thinks that the belief in God rests rather upon intuition or an immediate grasp of the Divine by the human soul. This theory, too, assumes different forms. (a) Sometimes the mind as a whole leaps intuitively to the thought of God. (b) In other forms the existence of a special faculty or organ of the mind is posited, the special function of which is to hold communion with the Divine. This organ, the spirit of man, is held capable of apprehending God without the help of the rational faculty.

(c) A third type places the organ of religion only in the feelings or emotions. It is by the power of feeling that man rises into fellowship with God. (d) A fourth theory denies that religion is confined to any faculty. It is not merely by the exercise of reason or feeling or the moral faculty or any other departmental activity that man reaches God. Knowledge of God is the work of the whole personality. Man has been created in the image of God, and therefore possesses divine affinity, and it is this divine affinity that forms the nexus which makes the knowledge of God possible. See Christianity; Deism; God; Religion; Theology.

H. T. Andrews

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Theiss (Hung. Tisza; Rum. Tisa). German name for river of Central Europe, before the First Great War entirely within Hungary. The longest affluent of the Danube, it rises in the Forest Carpathians in Ruthenia, Ukraine S.S.R.; it flows S. and then W., interlacing with the Rumanian frontier, and then passes into Hungary. From Csap it flows S.W. or S. across the Alföld past Tokay, Szolnok, Csongrad, and Szeged, S. of which it enters the Banát, Yugoslavia, and flows past Zenta to join the Danube below Titel. The river has an extremely tortuous course estimated to exceed 800 m. in length. Flood waters of the Danube dam the waters of the Theiss, which then floods its lower course, though this has been embanked and regularised. Steamboats reach Szeged, and small craft ascend the river as far as Tokay. *Pron.* Tice.

Thellusson, PETER (1737-97). British merchant. Born in Paris, June 27, 1737, son of the envoy of Geneva, he settled in London in 1762, and was naturalised. He acquired an immense fortune in trading with the Continent and the West Indies, and died July 21, 1797. His son Peter Isaac was created Baron Rendlesham, 1806.

Thellusson is chiefly notable for his will. After making some provision for his wife and children, he left instructions for the residue of his estate of over £600,000 to accumulate during the lives of his three sons and of their sons, and for the fortune thus accumulated to go to the eldest male descendant of his sons. This will was established by the house of lords in 1805, but the public disadvantage inherent in the principle of allowing property to accumulate indefinitely was recognized and led to the passing of the Accumulations Act of 1800. *See* Accumulation; Perpetuity. *Pron.* Tel-lusson.

Theme (Lat. *thema*). Subject set or proposed for discussion, a short essay. In music a theme is a definite melody which the composer intends to invest with special significance, and comprising one or more sentences. It is not quite synonymous with subject. The average fugue subject hardly attains to the dignity of a theme, while, on the other hand, a subject in a sonata or symphony may comprise more than one theme.

Themis. In Greek mythology, daughter of Uranus and Ga, the wife of Zeus before Hera. Among her children by Zeus were the three Horae (*q.v.*) or Hours, and

the Fates. Themis was the personification of law and order and presided over the oracle at Delphi before Apollo. *Pron.* Themmis.

Themistocles (c. 514-449 B.C.). Athenian statesman. In his early life, of which little is known, Athens



Themistocles, Athenian statesman

was one of the leading maritime cities of Greece, but no more; the genius of Themistocles realized the enormous capacity of the state for maritime development, and foresaw the imperial ascendancy which could follow only upon naval supremacy. Themistocles succeeded in procuring the ostracism or exile of the conservative leader Aristides in 483, and in bringing the direction of policy into his own hands.

In 480 the Persians invaded the Greek peninsula. The defence of Attica on the landward side became impossible after the forcing of the pass of Thermopylae; at the instigation of Themistocles, the Athenians evacuated their city, removed the non-military population to Aegina, and put every available man in the fleet, of which Themistocles was given command. By his ingenuity, the Persian fleet was brought to engage the Greek fleet in the Bay of Salamis, and it was primarily owing to the skill of Themistocles that the great Persian navy was there annihilated. The Persians thereupon evacuated Attica and prepared for a land campaign. The diplomacy of Themistocles compelled Sparta, through fear of the withdrawal of the Athenian fleet, to advance to the protection of Attica and win, in 479 against the Persians, the decisive victory of Plataea (*q.v.*).

It was again the energy of Themistocles which carried through the re-fortification of the Piræus before Sparta could take active measures to prevent it; and from

this time Athenian naval supremacy was assured. Athens became the wealthiest city of Greece, and Themistocles wisely remitted the tax on alien traders. He grew rich, of course, and in 471 was charged, though perhaps unjustly, with peculation, and was expelled from Athens. In his exile he was accused of treasonable intrigues with Persia, and he fled from his asylum at Argos to Asia. Whether he meditated revenge on his country is doubtful, but in Athens it was believed that he took poison through despair at the failure of his schemes. He died at Magnesia, where a vast memorial was erected. *See* Greece. *Pron.* The-miss-tokleez.

Thenardite. Natural form of anhydrous sodium sulphate found in saline residues of the alkali lakes of N. America.

Theobald, LEWIS (1688-1744). English Shakespearian editor. Born at Sittingbourne, son of a solicitor, he abandoned law for literature. He translated and emended many classical authors, published dramas and, dying in poverty, Sept. 18, 1744, was buried at St. Pancras. Theobald's fame rests on his edition of Shakespeare, 1734.

Theobald's Park. Mansion and park in Herts, England. The mansion, of red brick, built 1765-70, is 1 m. W. of Waltham Cross, and at one of the park entrances old Temple Bar (*q.v.*) was re-erected in 1888. The famous palace of Theobalds, built by Burghley, stood 1½ m. N.W. Frequently visited by Elizabeth, it was exchanged in 1607 for Hatfield (*q.v.*) by Burghley's son. James I died here. Dismantled in 1650, given at the Restoration to Monk, and granted by William III to the 1st earl of Portland, Theobalds was sold in 1762, and the remains of the palace disappeared in 1765. It gave its name to Theobald's Road, which runs from Southampton Row to Gray's Inn Road, London, W.C., part of the royal route from Whitehall to Theobalds; hence, also, Kingsway (*q.v.*). *Pron.* Tibbalds.

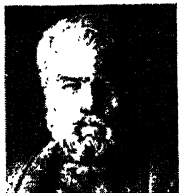


Theobald's Park, Hertfordshire. Main front of the 18th century mansion, built near the site of the historic house, a former royal residence

Theobromine ($C_7H_5O_2N_4$). An alkaloid occurring in the seed or bean of *Theobroma cacao*, from which cocoa is prepared. It is a white crystalline powder and is related to caffeine, the alkaloid of tea and coffee. The compound of theobromine and sodium salicylate is used as a diuretic.

Theocracy (Gr. *theos*, god; *kratein*, to rule). System of government under the immediate guidance of Divine power and wisdom; hence, a state so governed. The Israelites in their wanderings from Egypt until the establishment of the monarchy are the typical instance. See Divine Right.

Theocritus (3rd century B.C.). Greek poet. According to the best accounts he was born at Syracuse, but lived

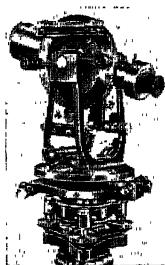


Theocritus,
Greek pastoral poet
From a bust

at Alexandria at the court of Ptolemy Philadelphus, and afterwards at Syracuse under Hiero II. A rude poetry in the Dorian dialect had been characteristic of the shepherds and rustics of his native Sicily, but Theocritus was the first to raise such poetry to the dignity of literary form. His epics, lyrics, and bucolics abound in passages of exquisite beauty, and show much dramatic skill in the character-drawing of the rustic interlocutors. Of some 30 extant poems known as Idylls (Gr. *eidyllia*, little pictures) attributed to Theocritus, half are purely pastoral. Theocritus has had many imitators: Virgil's Eclogues are closely modelled on the Idylls, and later imitators are Spenser and Milton. There is a good prose translation by Andrew Lang, 1880; one by Edmonds, with parallel text, in the Loeb Classical Library; and one of the Idylls by R. C. Trevelyan, 1947.

Theodicy (Gr. *theos*, god; *dikē*, justice). Term for a vindication of the Deity in relation to the world. It was first used by Leibniz (*q.v.*), in his *Essais de Théodicée*, 1710, and has become current in many theological and philosophical writings since. Leibniz attempted to demonstrate design in God's relation to the world, and to vindicate Him from the charge of having done anything without purpose or against reason. Hence arose the doctrine, ridiculed by Voltaire in *Candide*, of "the best of all possible worlds." See Optimism.

Theodolite. Instrument for measuring horizontal and vertical angles, although some of the simpler forms measure only horizontal angles. It is commonly used in surveying to obtain a system of triangles in a horizontal plane and the positions of objects within the triangles. When altitudes are measured separately, they are generally applied to correct chain calculations.



Theodolite.
Instrument used by
surveyors
By courtesy
of W. F. Stanley
and Co., Ltd.

The instrument consists of a small telescope mounted to turn about a vertical axis passing through the centre of a horizontal graduated circle, and also about a horizontal axis, so that it may be set at any elevation. An instrument fitted with a vertical graduated circle, in which the telescope can be rotated end over end, is known as a transit theodolite or altazimuth. If levels are provided in addition to the telescope, it becomes a universal instrument. A surveyor's transit has a compass mounted at the centre of the horizontal circle. Angular displacements in the direction of the telescope are read off with a micrometer comprising a microscope and a screw with a divided head.

At meteorological stations theodolites are sometimes used to follow "pilot balloons," i.e. small hydrogen-filled balloons, in order to obtain the velocity and direction of the upper winds. In this case the telescope is so mounted as to permit of rotation in both altitude and azimuth, and a right-angled prism is incorporated to enable the observer to look horizontally into the eyepiece irrespective of the altitude of the balloon. Greater accuracy is achieved by the use, simultaneously, of two theodolites, one at either end of a measured base line. See Map and Map-making; Surveying.

Theodora. Name of three Byzantine princesses. (1) Wife of Justinian I. Born in Cyprus or Constantinople, she was in turns actress, courtesan, mistress, and from 523 the wife of Justinian. She had great influence over her husband, was acknowledged as empress in 527 and supported the Monophysite heresy. By her courage and firmness she prevented

Justinian from abandoning the capital at the time of the Nika riot, 532. She died in 547. (See Circus.)

(2) Wife of the East Roman emperor Theophilus. After his death, 842, she administered affairs for her infant son Michael III. In opposition to her husband, she was a supporter of the worship of images, which was definitely restored at a synod convened by her at Constantinople.

(3) Last empress of the Macedonian dynasty. Sister of the Empress Zoë (d. 1050), she succeeded her brother-in-law Constantine IX and reigned 1055-56.

Theodore. Masculine Christian name. Of Greek origin, it means the gift of God. Dorothea is a feminine form; Theodora and Theodosia are others. Bearers of the name include two popes, Theodore I (642-49) and Theodore II (897). It has also been that of three rulers of Russia. Theodore I, tsar 1584-98, was son and successor of Ivan the Terrible, but ceded his power to Boris Godunov; Boris's son, Theodore II, was tsar in 1605, being murdered July 10; Theodore III, tsar 1676-82, carried through a number of reforms.

Theodore of Mopsuestia (c. 350-428). Biblical scholar of the Eastern Church. Born at Antioch, in 393 he became bishop of Mopsuestia in Cilicia. A leader of the literalist school of exegesis, he wrote a commentary on practically the whole Bible, but only sections are extant.

Theodore of Tarsus (c. 602-690). Seventh archbishop of Canterbury. He came from Tarsus



Theodora (centre), wife of Justinian I. From contemporary mosaic in the church of S. Vitale, Ravenna

in Cilicia, where he was a leader of the Eastern Church, to be appointed to the English primacy by Pope Vitalian in 668. He held the first synod of all the English clergy at Hertford in 673, appointed Earconwald and Trumwine bishops to the East Saxons and Picts respectively, and generally ranks high among organizers of the English Church.

Theodoret (c. 393–457). Syrian historian. Born at Antioch, he became in 423 bishop of Cyrrhus near that city. Being suspected of Nestorianism, he was deposed by the Robber council in 449, but was reinstated by the council of Chalcedon. He was the author of an ecclesiastical history, a continuation of Eusebius, dealing with events from the rise of Arianism in the reign of Constantine down to the death of his teacher Theodore of Mopsuestia; and a defence of Christianity against the charges of heathen philosophers.

Theodoric. Name of two kings of the Visigoths or West Goths. (1) Theodoric I, king 418–451, eldest son of Alaric I, was killed at the battle popularly known as Châlons (q.v.). (2) Theodore II, king 452–466, his brother, ruled over most of Gaul and Spain. He was murdered by another brother Euric.

Theodoric the Great (c. 454–526). King of the Ostrogoths or East Goths, and ruler of Italy, 493–526. He was born in Pannonia, the son of Theodemir, by whom he was sent as a hostage to Constantinople. On succeeding to the throne of his father in 473, he received signal favour from the East Roman emperor Zeno, who bestowed upon him high military command and the consulship. At first a loyal supporter of Zeno, Theodoric was driven by the distressed condition of his subjects to demand a share in the more fertile districts of Italy. Threatened by the danger of a Gothic attack upon Constantinople, Zeno gave him permission to attack Odoacer, Gothic ruler in Italy, and Theodoric won the battles of the Sontius and Verona, 489, and took Ravenna by siege. The treacherous murder of Odoacer left Theodoric master of Italy, which he ruled nominally as Zeno's vice-regent, in reality as an independent sovereign.

During his 33 years of rule Italy was at peace and prospered exceedingly. He did much to promote agriculture and commerce, and was a patron of arts and literature, although a man of little education. He reduced taxation,

improved the roads and communication, preserved the Roman institutions, and chose as his chief ministers Boetius and Cassiodorus. But his efforts to bring about a real union of Goths and Romans failed, chiefly because the orthodox Romans refused to recognize the Arian Goth as anything more than the delegate of the emperor at Constantinople. Naturally he was tolerant, but the persecution of the Arians rendered him suspicious of his most loyal subjects, and the greatest blot on his career was the execution of Boetius on the charge of complicity in a plot. Theodoric died Aug. 30, 526, and was buried at Ravenna in a splendid mausoleum, still to be seen. As Dietrich of Bern (Verona), he became the hero of a cycle of German legends. *See* Boetius; Cassiodorus; Goths; Odoacer. *Consult* Theodoric the Goth, T. Hodgkin, 1891.

Theodor von Neuhof (1686–1756). German adventurer. Born at Metz, Jan. 26, 1686, son of a Westphalian refugee nobleman, he was educated in the household of the duke of Orléans, served in the Swedish army, engaged in Jacobite plots, gambled in Paris in John Law's speculations, and at Florence entered into relations with Corsican refugees. In 1736 he obtained from the government of Tunis a vessel and munitions of war, sailed for Corsica, and on April 15 was proclaimed king under the title of Theodore I. Later in the year he visited the Continent to obtain further help against the Genoese masters of Corsica. Successive attempts to return failed, and Theodore died in London, Dec. 11, 1756. He had just been released from a debtors' prison, partly because of the great exertions of Horace Walpole.

Theodosia. Alternative spelling for the seaport of the Crimea entered in this Encyclopedia as Feodosia.

Theodosius I (346–395). East Roman emperor, A.D. 379–395. Probably born at Cauca, Spain, the son of Theodosius, a general of Valentinian I, he served under his father in Britain, and as commander-in-chief in Moesia, defeated the Sarmatians in 374. In 379 he was called to the eastern throne by Gratian, emperor of the West, just after the disastrous defeat of the Romans by the Goths at Adrianople, where the eastern emperor himself fell. Theodosius was equal to the emergency, and by 382 had cleared the Balkan peninsula of

the Goths. In 383 Maximus was proclaimed emperor by the troops in Britain, and after defeating Gratian, was acknowledged by Theodosius as ruler of Britain, Spain, and Gaul. When Maximus in 388 expelled Gratian's half-brother Valentinian II from Italy, Theodosius came with an army, and Maximus was defeated at Aquileia and put to death.

The reign of Theodosius was marked by the complete triumph of orthodox Christianity. His outlook was dominated by S. Ambrose and the result was seen in many enactments prohibiting pagan and heretical worship in both sections of the empire. The unnecessary severity with which he punished a riot in Thessalonica, some 7,000 citizens being massacred, brought down upon Theodosius the displeasure of the great churchman, who for eight months refused him an entrance into his cathedral until he had done penance. Theodosius died at Milan, Jan. 17, 395. *See* Ambrose.

Theodosius II (401–50). East Roman emperor 408–450. He succeeded his father Arcadius at the age of seven, being placed under the guardianship of his sister Pulcheria, a sincere but austere Christian, who completely dominated him. She chose for him as wife Eudocia (q.v.), whose banishment she afterwards secured. Theodosius took no part in wars against the Huns and the Persians during his reign, and his name is chiefly associated with the code of laws, Codex Theodosianus, begun in his reign and completed in that of Valentinian III.

Theodule Pass or **MATTERJOCH**. Mt. route of the Alps, between the Swiss canton of Valais and Piedmont, Italy. It leads from Zermatt to Valtournanche, traversing the saddle between the Matterhorn and the Breithorn, and reaching an alt. of 10,900 ft.

Theognis (c. 540–500 B.C.). Greek elegiac poet. A native of Megara in Attica, he belonged to an aristocratic Dorian family which had suffered from a democratic upheaval. A collection of some 1,400 verses, to which his name is attached, contains a bitter attack upon the bad citizens, the democrats, who are contrasted with the good, the aristocrats. Most of the poems are addressed to a young Megarian noble named Cynrus, and, in addition to a number of gnomes and sententious maxims, sing the praises of wine and club life. Much of the collection is of later date. *See* Gnome.

THEOLOGY IN MODERN THOUGHT

The Very Rev. W. R. Matthews, K.C.V.O., D.D., D.Lit., Dean of S. Paul's

In this connexion see the articles Christianity; Church; Religion; and those on related matters, e.g. God; Incarnation; Theism, etc. See Free thought; also Bible; Jews; Paul; Saint.

Theology is the science which deals with our knowledge of the nature of God and His relation with the world. There may be deep religious experience without any highly developed theology, but some kind of belief about the meaning of the world and the character of the Divine is implied in all forms of religion. Every religion, therefore, has a theology, explicit or implicit. The aim of theology is to give a coherent account of religious beliefs, to indicate their relations with one another, and to bring them into harmony with the general knowledge and thought of the time.

Change in scientific and philosophical conceptions must react upon theology and cause it to think out again its problems in this new light. The possibility of theology has been denied. Agnostics such as Herbert Spencer have held that the reality and the significance of the universe must be beyond our comprehension. It must be admitted that complete knowledge of God is unattainable, and therefore the conclusions of theology must always be inadequate.

Theology and Philosophy

There is a close connexion between theology and philosophy. Both agree in attempting to interpret the meaning of the world as a whole. Theology, however, although it pursues rational methods, lays stress on the importance of revelation, in which it finds its most significant material for the solution of the problems which it has in common with philosophy, and a large part of its task consists in interpreting revelation and vindicating its claim.

The present time is one of transition and reconstruction in theology. This is an inevitable result of new conceptions established in science and history. (1) The advance in literary criticism as applied to the Bible has given a new insight into the religious development of the Hebrews, and has forced theologians to reconsider the meaning of inspiration. (2) The idea of evolution has profoundly affected all branches of knowledge. It has necessitated a fresh consideration by theology of the doctrine of creation, and has also modified the manner in which the problems of religion are approached. (3) The advance of anthropology and sociology has forced

theologians to reflect on the place of Christianity in the development of religion. The main outlines of Christian theology, however, remain the same.

A common distinction is made between natural and revealed theology. This scholastic distinction has been widely adopted in modern thought, though the dividing line has been drawn in many different places. The truths of natural theology are those which are attainable by the human reason and may be reached by philosophy. Other truths which, though not contrary to reason, are not discoverable by its unaided power, are said to belong to revealed theology.

The value of this distinction is denied by some contemporary writers, but no definitely Christian theology pretends to do without revelation in some form. The idea of revelation in its widest sense implies a special manifestation of God for the purpose of imparting new insight into the meaning of the world and the purpose of life, and of confirming the highest intuitions of the human soul on these questions. That this is a reasonable idea is obvious if we postulate the existence of God. A difficulty arises when we ask what are the credentials of revelation. During most of the history of the Christian Church much importance was attached to the so-called external evidence, i.e. the miraculous.

At the present time the emphasis has altered. Though the miraculous has its value as evidence, a moral and spiritual revelation must be supported, in the first place, by moral and spiritual evidence. Thus the essence of revelation is found in the religious experience of great personalities. The general development of the religious consciousness of the Hebrews seems to afford a unique example of religious and moral illumination, an illumination which culminates in the teaching of Christ. This conception forbids us to confine it to one nation or race.

An important school of Protestant theology, represented by Dr. Karl Barth, would repudiate "natural theology" altogether and would confine the function of theology to the systematic statement of the contents of revelation. Revelation—the Word of God—is taken as the given, the

starting point of theology. It is not clear how these theologians suppose that revelation is recognized as such or what evidences of truth it brings, but they appear to hold that the Word of God is its own evidence; its witness is the "testimonium Sancti Spiritus," the testimony of the Holy Spirit, in Calvin's phrase.

THE IDEA OF GOD. The character of any system of theology is determined by its conception of God; and this is dependent upon the religious experience which the theology takes to be authoritative. Thus, although the idea of God has varied in the course of the history of Christian thought, all systems of Christian theology regard the teaching and experience of Jesus as of critical importance. The characteristic element in the Hebrew conception of God is that of holiness and righteousness. This thought is carried on and developed in the N.T., which insists that the essential nature of God is fatherhood and holy love. To defend this conception it must be held that God is personal, though not necessarily a person, otherwise He could not have any personal relation with men. Further, theology is concerned to vindicate both the immanence and the transcendence of God. God cannot be entirely distinct and separate from the world, otherwise there would be no possibility of real communion with Him. Nor, on the other hand, can He be merely immanent, since, in that case, it would be impossible to regard Him as personal, and difficult to maintain a real distinction between moral good and evil. Theology is thus led to the view that God is personal and both immanent and transcendent—neither identical with the universe nor completely outside it.

Doctrine of the Trinity

A characteristic doctrine of Christian theology is that of the Trinity. The motive which led to its development was the desire to vindicate the true divinity of Christ. The doctrine, however, found support in Platonic philosophy, and has been congenial to more than one school of modern philosophy. The fundamental significance of the doctrine is that there are distinctions within the Godhead—that the Godhead is a unity and not a bare unit. It is important to observe that the word person used in the formulation of the doctrine has changed its meaning and conveys to us a greater degree of separateness than was originally the case.

As for the relation of God to the world, Christian theology regards Him primarily as its creator. Other views are that God is identical with the world (pantheism), that the world is an emanation of God, or that God and the world are coordinate (dualism and pluralism). The doctrine of creation insists upon the thoroughgoing dependence of the world upon God and at the same time on the reality of moral freedom. Most theologians have held that creation implies an absolute beginning in time, but this is questioned by several contemporary Christian thinkers. Other topics which are dealt with by theology under this head are providence, the philosophy of history, and the miraculous.

THE IDEA OF INCARNATION. That there has been a supreme manifestation of God in the person of Jesus Christ is a fundamental conviction of Christianity, and it is part of the task of theology to interpret this belief to the understanding. The fact of the Incarnation is witnessed to by the records of the N.T., by the impression made by Jesus on the minds of the disciples, and by the religious experience of the Church. The doctrine of the Incarnation was definitely formulated under the stress of controversy, and more particularly of the Arian controversy. The orthodox doctrine is that Christ is of "one substance with the Father," and that He is two natures, divine and human, in one person. This statement was adopted in the councils of Nicaea, 325, and Chalcedon, 451. This formulation of the doctrine has been criticised by many liberal Protestants and by Catholic modernists, either because they cannot accept the full idea of incarnation, or on the ground that the formula is not in harmony with modern psychological and philosophical views. The doctrine of the Incarnation is one of the central battle-grounds at present in Christian theology.

All the higher religions are religions of redemption, i.e. they profess to point out a way of salvation from sin and misery. Christianity is from the beginning a redemptive religion. But there is no orthodox doctrine of redemption, and in the N.T. itself different presentations of the idea may be discerned.

The nature and destiny of man, the origin and meaning of sin, grace, and the means of grace are topics which have given rise to important controversies, which are now reopened by modern scientific knowledge. The idea of the Church

has given rise to a fundamental cleavage of opinion, the Protestant conception being in the main that of a voluntary association for religious purposes, while the R.C. is that of a supernatural society with a divinely ordained organization.

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Theophany (Gr. *theos*, god; *phainesthai*, to appear). Theological term for the revelation of God to man—in the O.T. by sounds and symbols, in the N.T. through Christ, whose second coming is to be the completion of the theophany, or Christophany. See Epiphany.

Theophilanthropism. Name assumed for a species of naturalistic religion started by French deists in Paris during the Reign of Terror, 1793. It aimed at superseding Christianity by a form of faith and worship, whose leading feature was to be love of God and man. It appears to have been imitated from a form of deism started about 1776 by a Unitarian minister named David Williams, who officiated as a "priest of nature" at a chapel which he opened in Margaret Street, London. He had the support of Voltaire and Frederick the Great. In France the sect was led by La Révellière-Lépeaux, a member of the Directory, and the worship included offering flowers and fruit on an altar on which a perpetual fire burnt. The four "saints" whose festivals were observed were Socrates, S. Vincent de Paul, Rousseau, and Washington. The sect was suppressed in 1801, and soon afterwards died out. See Deism.

Theophilus (8th century). Traditional coadjutor bishop of Adana in Cilicia. Having been deposed from his position, he gave a bond to the devil exchanging his soul for immediate reinstatement in his office; then, overtaken by remorse, after long fasting and prayer he successfully prevailed on the Virgin Mary to intercede for him, and three days later died. The story, found in early Dutch, German, and Icelandic versions, appears to have become current in the West before the 10th century, and was an original element in the Faust legend.

Theophilus was also the name of an East Roman emperor, 829-842, who opposed image-worship and raised his court to a high level of culture.

Theophrastus (c. 372-288 B.C.). Greek Peripatetic philosopher. Born at Eresus in Lesbos, his original name being Tyrtamus, he studied at Athens under Plato and Aristotle. The latter persuaded him to change his name to Theophrastus (divinely eloquent), appointed him his successor in the presidency of the Lyceum in 322 B.C., and committed to him all his writings at his death. Theophrastus achieved such a reputation that his pupils numbered 2,000. Of his 200 writings, some twenty are extant in whole or in part. The best known is a moral treatise called *Characters*, brief and incisive sketches of various classes of persons, which found numerous French and English imitators in the 18th century. There is an admirable translation, with text and notes, by R. C. Jebb, 1870, rev. ed. J. E. Sandys, 1909. But his reputation chiefly rests upon his extant works, *History of Plants* and *The Origins of Plants*, which were regarded as authoritative during the Middle Ages. There is a translation of the *History of Plants* by A. F. Hort in the Loeb Classical Library.

Theophylline OR **THEOCIN** ($C_7H_8O_2N_4$). Isomer of theobromine occurring with caffeine in tea. Caffeine, theobromine, and theophylline are described as "xanthines," all of which possess a diuretic action. Theophylline may be used in the form of its powder, or combined with ethylene diamine (aminophylline), or with sodium acetate. It has been synthesised from dimethyl urea.

Theopompus. Greek historian. Born in Chios, 376 B.C., he was banished owing to his father's Laconian sympathies. He went to Athens, where he was a pupil of Isocrates, and returned to Chios in 333. Being again driven out by the anti-Macedonian party, he travelled extensively, practising as an advocate and delivering epideictic or show speeches in various towns. He was the author of *Hellenica*, a history of Greece from 410 to 394. In 1907 there was discovered a lengthy papyrus fragment which is considered by some to be part of this work. His *Philippica* in 58 books contained an account of the times of Philip of Macedon, with numerous excursuses.

Theorbo. Large lute with a double neck, having two sets of tuning pegs. The lower set applied



Theorbo of the
17th century

to the strings over the fretted fingerboard, tuned in 4ths, with a 3rd in the middle, while the upper held the bass strings, which were tuned in 2nds and were played as open notes (diapasons).

Theorem (Gr. *theorein*, to consider). General proposition that is not self-evident but is demon-

strable by reasoning. An example of a self-evident proposition is $2 + 2 = 4$; of a theorem, that the angles at the base of an isosceles triangle are equal. In mathematics, physics, and geometry a theorem is something which has to be proved, while a problem has to be "done" or solved.

Theory (Gr. *theorein*, to consider). As distinguished from practice, speculative knowledge without any reference to practical application; in this connexion an unfavourable sense, the idea of insubstantiality is often attached to it. In scientific language, theory is an explanation of phenomena, based on established principles, as contrasted with hypothesis, which merely assumes the operation of a principle. The theoretical method is deductive, proceeding from the general to the particular, from principles to facts. Theoretical knowledge, according to Aristotle, was superior to practical in that, as dealing with universals, it alone was real knowledge, whereas practical knowledge dealt only with particulars.

Theosophy (Gr. *theos*, god; *sophia*, wisdom). Name applied to various systems of mystical philosophy and religion, professing to derive special knowledge of the nature of God and His relations with man, either from deductive speculation or from revelation. Neoplatonism and Gnosticism are early forms of theosophy. From these and from the Cabbala (*q.v.*) modern systems from the 16th century onwards are in part derived. Paracelsus, Giordano Bruno, and above all Jakob Boehme, were prominent theosophists.

In a narrower sense the term is generally applied to a system propagated by H. P. Blavatsky and H. S. Olcott, who together founded

the Theosophical Society in 1875 in the U.S.A. The system aims at establishing a universal brotherhood by showing the unity of all religions, especially in their esoteric teaching, manifested by occult phenomena. Modern theosophy is an eclectic system, which critics declare to be a somewhat crude compilation of half understood elements in Buddhism and other systems. A fundamental doctrine is that of Karma, the law of retribution by which destiny is strictly determined by successive acts. The soul advances to Nirvana along the path of perfection through a series of incarnations. See Besant, A.; Blavatsky, H. P.; Buddhism; Karma; Mysticism; Nirvana; consult also Theosophy and the New Psychology, A. Besant, 1904; Key to Theosophy, H. P. Blavatsky, 1913.

Theotocopuli, DOMENICO (c. 1541-1614). Greco-Spanish painter. He was a native of Crete, and in Spain was called El Greco (the Greek). He became a pupil of Titian, and was influenced by Tintoretto, Bassano, and other Venetian masters. After painting in Venice and Rome, he left Italy c. 1576 to spend the rest of his life at Toledo, where he died, April 7, 1614.

At Toledo he identified himself with Spanish mysticism, and his earliest Spanish pictures include nine canvases for the church of S. Domingo el Antiguo, and the Espolio (the stripping of Christ) for the cathedral. His Dream of Philip II, at the Escorial, and the Martyrdom of S. Maurice, an intense expression of religious feeling, mark the transition to his later, best-known style. His finest qualities as a portrait-painter are exemplified in the Burial of Count Orgaz, and the Grand Inquisitor. In such later works as Laocoön, Baptism of Christ, The Opening of the 5th Seal, his linear stylisations gave rise to the legend of his madness.

El Greco's paintings of religious subjects, with their intense elongations and acrid colouring, are ecstatic visions, dream-like distortions of forms, released from earthly perceptions. His life and

reputation, having been neglected for some three centuries, were rediscovered by the Post Impressionists, acclaimed by Cézanne and his disciples, and later by the Expressionists. He is represented in the National Gallery, London, by Christ's Agony in the Garden, and The Cleansing of the Temple.

El Greco forms the subjects of many monographs and critical analyses. They include the standard work of Cossio, 1908, and those of Calvert and Hartley, 1909; M. Barres, 1911; J. F. Willumsen, 1927; F. Rutter, 1930; L. Goldscheider, 1938.

Thera. Ancient name of the Greek island in the Cyclades group, now known as Santorin (*q.v.*).

Theralite. Name given to a group of igneous rocks akin to gabbro and dolerite but containing nepheline. They are found in Lanarkshire, Bohemia, W. Alps, N. America, etc. See Igneous Rocks; Teschenite.



Theotocopuli (El Greco). Christ's Agony in the Garden, a painting in the National Gallery, London

Theramenes (d. 403 B.C.). Athenian politician. Born in the island of Ceos and trained in philosophy and rhetoric, he entered public life in 411, when he was active in setting up the oligarchy of the Four Hundred (*q.v.*) at Athens. Disapproving of their extreme measures, he went over to the democrats. After the Athenian defeat at Aegospotami, 404, he concluded a humiliating peace with the Spartan Lysander. One of the Thirty Tyrants set up by Sparta, his opposition to their excessive severity brought him into collision with Critias (*q.v.*), who declared him a traitor to the constitution. Theramenes defended himself with eloquence and with apparent success when, by the orders of Critias, he was dragged from sanctuary, and forced to drink hemlock. *Protr.* Theer-ammeneez.

Therapeutae (Gr. *therapeutēs*, worshipper). Egyptian branch of the Jewish sect of the Essenes (*q.v.*). They differed from the Essenes of Palestine in adopting a hermit life instead of one in community, were less influenced by Oriental philosophy, devoted themselves to contemplation, and assembled on the Sabbath for worship and a mystic meal.

Therapeutics (Gr. *therapeuein*, to treat medically). Branch of medicine which pertains to the treatment of disease. See under the names of various diseases.

Theresopolis. Town of Brazil, in the state of Rio de Janeiro. It stands at an alt. of 2,600 ft., 17 m. N.E. of Petropolis. Formerly capital of the state, it is now a summer health resort.

Therezina. Town of Brazil, capital of the state of Piahy. Situated on the right bank of the river Parnahyba, 220 m. from its mouth, and 60 m. S.E. of Caxias, it has several educational institutions, cotton and soap works, iron foundries, and a large sugar refinery. Pop. est. 64,000.

Therm (Gr. *thermē*, heat). In physics, name given to the British thermal unit of heat, generally abbreviated B.Th.U. It is the amount of heat required to raise one pound of water at its maximum density through 1° F. The calorie (*q.v.*) is the corresponding metric unit of heat. A therm equals nearly 252 calories. The term therm is used in the British gas industry for 200 cu. ft. of gas, which equals 100,000 B.Th.U.s. See Units, Electric.

Thermae. Name given to the elaborate bathing establishments of imperial Rome. See Baths.

Thermal Capacity. In physics, the quantity of heat required to raise a body through one degree of temperature. It may be measured in therms, calories, or joules, and is numerically equal to mass multiplied by specific heat. The thermal capacity of any particular body is usually expressed in terms of the quantity of water that has the same heat capacity.

Thermal Diffusion. Separation produced in a uniform mixture of two gases when a temperature gradient exists. The heavier molecules diffuse towards the cooler, and the lighter ones to the hotter, side of the enclosure. The greatest separation is effected if the components are of very different masses and sizes. The phenomenon has been applied to the separation of isotopes of uranium which is used in the form of uranium hexafluoride, a

vapour at moderately high temps. Some 4,000 stages are necessary to effect a 99.3 p.c. separation.

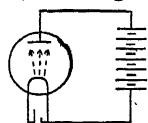
Thermal Neutrons. When ordinary high-speed neutrons are incident on a light material, *e.g.* water or paraffin, their energy will be reduced. Its value will approach $\frac{2}{3} kT$, corresponding to that of a particle in thermal equilibrium with its surroundings; k is the Boltzmann gas constant per particle, and T is the absolute temperature. Such neutrons are termed thermal or C neutrons, and at 300° abs. temp. the energy of such a neutron will be approximately 0.038 electron volts.

Thermidor (Gr. *thermē*, heat; *doron*, gift). Name of the 11th month in the year as rearranged during the French Revolution. It began on July 19 or 20. The rising against Robespierre in 1794 occurred on the ninth of Thermidor. See Calendar.

Thermionics. Subject concerned with the emission of electrons from substances under the action of heat, and therefore, through the thermionic valve, the basis of the science of electronics (*q.v.*).

Thermionic Valve (Gr. *therme*, heat; *ion*, going; Lat. *valva*, leaf of folding door). Vacuum bulb containing two or more electrodes. The basic principle of the thermionic valve was discovered by Edison, but no practical use was found for what was known as the "Edison effect" and it remained a laboratory curiosity until 1904, when J. A. Fleming (*q.v.*) produced the first thermionic valve, the Fleming diode.

The principle is this: the glowing tungsten filament of an ordinary electric lamp emits electrons into the surrounding vacuum. These make short journeys and eventually return to the filament. If, as in Fig. 1, a metal plate is sealed into the bulb and maintained at a positive potential, a stream of electrons is drawn across the vacuum from filament to plate; the electrons are minute particles of negative electricity

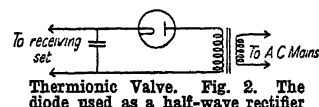


Thermionic Valve. Fig. 1. A stream of electrons is drawn from filament (or cathode) to anode of an evacuated bulb

and they respond to the very strong attraction exerted on them by the positively charged plate called the anode. Were the anode made negative it would repel the electrons emitted by the filament, or cathode, and no current could pass. In battery-operated valves

electron emission takes place from a filament heated by the passage of current through it. Emission in most mains-operated valves is from a cathode which is brought to the necessary temp. by the action of a separate heater. If the tungsten is treated with thorium, emission is obtained at a much lower temp. The thermionic valve obtained its name because it exercises the same effect on an electron stream as do mechanical valves (*e.g.* the valve of a bicycle tire, the inlet and exhaust valves of petrol and steam engines, the ball-tap of a cistern) on the flow of gases, steam, or liquids: all permit a current to pass in one direction only.

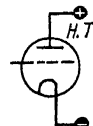
The diode is much used in radio, radar, television, and other apparatus. The majority of A.C. mains wireless receiving sets, for instance, have a diode rectifier, which can be arranged as in Fig. 2. Current passes only during the positive half of each cycle, when



Thermionic Valve. Fig. 2. The diode used as a half-wave rectifier

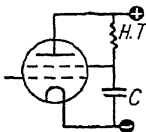
the anode is made positive. The negative half-cycles are, so to speak, strained out and "spurts" of uni-directional current are delivered by the valve. These are smoothed by suitable circuits into steady D.C. This process is called half-wave rectification. In practice a full-wave rectifier is usual. This consists of a double-diode valve, which has two anodes and a common cathode. One end of the transformer secondary windings is connected to each anode. Every half-cycle thus drives one of the anodes positive and produces a flow of current. The diode also has many other uses. (See Electronics).

Lee de Forest developed the triode, or three electrode valve (Fig. 3). Between the cathode and the anode a grid (usually a helix of fine wire) is inserted. Since the grid is closer to the cathode than is the anode, potentials applied to it exercise a greater effect on the electron stream. It may, for example, be found that to increase the cathode-anode current by 2 mA the anode potential must be raised by 10 V., but that the same increase can be obtained by leaving the anode potential unaltered and



Thermionic Valve. Fig. 3. The triode

making the grid only one V. more positive. The efficiency factor, or mutual conductance (symbol g_m) of a valve is the ratio of the change in anode current to the change in the grid volts. A one-V. change in the grid voltage produces a 2 mA. change in the anode current. The mutual conductance is thus 2 mA. per V., usually written 2 mA/V. If an alternating voltage reaching +1 V. at the crests of the positive half-cycles and -1 V. at the troughs of the negative half-cycles is applied to the grid of the valve, it will have as much effect on the anode current as would an alternating voltage rising to +10 V. and falling to -10 V. applied to the anode. In other words, a ten-fold amplification of voltages applied to the grid occurs at the anode. The amplification factor of a valve (symbol μ) is the ratio of the change in anode V. to the change in grid V. producing the same effect, here 10.



Thermionic Valve.
Fig. 4. The screen-grid valve

One other important factor is the anode resistance (symbol r_a) which is the ratio of the change in anode volts to the change in anode current which it produces. In making the calculation the anode current must be measured in Amps. A change of 0.002 Amp. (2 mA.) is produced by a change of 10 volts. The anode resistance is thus $10 \div 0.002$, or 5,000 ohms.

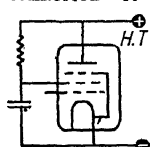
The triode can do other things besides amplifying: it gives good service both as a detector and as an oscillator (see Radio). Any two conductors separated by an insulator, or dielectric, form a capacitor, or condenser. Such capacitors are formed in the triode by anode and grid; grid and cathode; anode and cathode. Alternating and oscillating currents can pass through capacitors; the higher their frequency, the smaller is the opposition to their passage offered by a capacitor of given value. The stray capacitances, as they are called, which are inevitable in the triode, may allow high frequency currents to leak into paths other than their proper ones and to produce highly undesirable effects.

The capacitance between two conductors can be reduced to zero by placing an earthed conducting screen between them. This is what is done in the screen-grid valve (Fig. 4). The screening

grid is not directly earthed; but the large capacitor C offers so little opposition to the passage of high-frequency currents that it is as good as earthed, so far as they are concerned.

The chief virtue of the screen-grid, four-electrode valve, or tetrode, is that it allows enormous amplification at high frequencies. It has, however, one serious drawback. Suppose that we apply a fixed potential of, say, 80 V. to the screen and gradually raise the anode voltage, starting from zero. At first the anode current increases as the anode voltage is increased; then comes a point at which it begins to fall. This fall continues for some time as progressive increases are made in the anode voltage. Then the anode current begins to rise steeply again for a time, and again the rise becomes small, no matter how much the anode V. are increased.

What is happening during the unexpected fall is that fast-travelling electrons from the cathode knock other electrons out of the anode, and these secondary electrons are captured by the positively charged screen, the anode is robbed of electrons, and its current falls. Later, when the anode voltage is made higher than that of the grid, the secondary electrons are attracted back to the anode before they have gone very far. All this is avoided in the five-electrode pentode valve (Fig. 5), in which a suppressor grid, connected to the cathode, is



Thermionic Valve.
Fig. 5. The pentode

The pentode is a most useful valve with an amplification factor of 2,000 or more; its stray capacitances are very small indeed.

Hexode (6 electrodes), heptode (7 electrodes), and other complex valves are used for particular purposes. The diode-triode, the triode-hexode, and the double diode-pentode are really assemblies, with a common cathode, of two or more valves in one bulb.

Thermistor OR VARISTOR. Small device made from a carbon-like material, which has a high negative temperature coefficient of resistance, e.g. a typical element has a resistance of 1,500 ohms at

10° C. which falls to 1,000 ohms at 40° C. Because of their small size thermistors show a fairly rapid response to fluctuating temperatures, and therefore find use, as thermometers, for the measurement of thermal radiation, for thermostatic control, and for many biological purposes.

Thermit OR THERMITE. Mixture of magnetic iron oxide and aluminium powder used for the production of high temperatures. The mixture is placed in a crucible and the reaction started by means of a priming of barium peroxide and aluminium powder, into which a piece of magnesium ribbon is inserted and fired. A very violent reaction takes place, and a temperature of about 3,000° C. is obtained. The compound is used for welding iron or steel rails together, and can be employed *in situ*. It is also employed for repairing defects in steel castings. Alloys can be made with thermit by employing mixtures of oxides of the metals. In this way chromium, manganese, molybdenum, vanadium, and similar metals can be produced. These are used to harden iron and steel. Incendiary bombs contain thermit.

Thermit explosives is the name of a class of composite explosives in which one of the ingredients is a metal, or metallic compound, capable of being easily oxidised, which develops considerable heat on combustion. Reactions utilising aluminium and metallic oxides are sometimes called thermite reactions. See Incendiary Weapons; Welding.

Thermo-chemistry. Branch of chemistry which deals with the heat equivalent of chemical changes. Chemical reactions are almost always accompanied by changes of temperature. When heat is evolved the reaction is termed exothermic, and the compound formed an exothermic compound. When heat is absorbed it is an endothermic reaction. Violent reactions are generally exothermic, and exothermic compounds are usually characterised by great stability. The heat absorbed when a substance is split up into its components is known as the heat of decomposition, the heat of formation being that absorbed or evolved when a substance is formed. Heat changes are measured by means of an instrument known as a calorimeter, one form being that in which the reaction takes place in a large excess of water, while the other variety allows of the complete combustion of the substance in oxygen.

Hess stated as a law of thermochemistry that the amount of heat involved in a chemical change between definite amounts of different substances is always the same, provided that the initial and final products are the same in each case. This is, however, a corollary of the law of the conservation of energy. It has been proved experimentally; the same substance cannot be prepared possessing different proportions of chemical energy. If a particular substance is made by means of a series of reactions the algebraic sum of the heat absorbed or produced is the same. This is known as the law of constant heat summation. See Chemistry.

Thermocouple. A system in which an E.M.F. is generated by means of two wires of dissimilar metals, connected in series, which are subjected to the influence of a source of heat acting at their point of union, the remainder of the circuit being at a lower temperature. The E.M.F. is produced by a combination of the Peltier and Thomson Effects (*qq.v.*) and is commonly used as a means for measuring temperature (see Pyrometer). The metals from which the two wires are made are therefore chosen to give the maximum E.M.F. consonant with stable electrical conditions and ability to withstand the maximum degree of heat. The ideal combination is that in which increased temperature, by the Thomson effect, produces a uniform increase in potential in one wire and a uniform decrease in potential of the other, with the Peltier effect tending to give a uniform increase in the difference in potential between the wires. At the same time the wires should not melt or soften too much at their operating temperatures and should not oxidise or corrode too rapidly.

Thermodynamics (Gr. *thermē*, heat; *dynamis*, power). Science which deals with the relations between heat and work. Rumford and Davy, the former from observing the heat caused by boring cannon and the latter by melting ice by friction in a vacuum, concluded that there was a relation between heat and work. It was not, however, until the experiments of Joule that the mechanical equivalent of heat was determined. Previously, Carnot had developed the idea of a cycle of heat operations, and upon his researches and those of Joule are based the two fundamental laws of thermodynamics. The first law states that a definite quantity of heat is absorbed for

each unit of work produced, and conversely that a definite quantity of heat is produced by a given quantity of work. The mechanical equivalent of heat, *J*, expresses the fact that one gram-calorie is equivalent to 4.18×10^7 ergs of mechanical work. The second law, due to Clausius working on the Carnot cycle, states that it is impossible to convey heat from one body to another at a higher temperature by the agency of a purely self-acting machine. In other words, heat energy of itself always passes from high to low temperature. See Carnot's Cycle; Entropy; Heat; Ice-Making; Joule; Specific Heat.

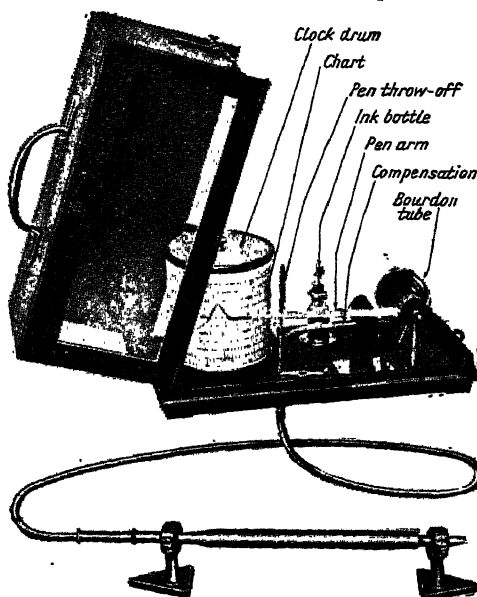
Thermo-electricity. Study of electric currents caused by heat. Seebeck, in 1822, noticed that when a circuit was formed of two or more different conductors and the junctions of the conductors were at different temps., an electrical P.D. between the junctions was a function of the difference in temp. If the circuit is closed a current may be made to pass one way round the circuit or the reverse, according to the temps. of the junctions. By suitably choosing the metals of a circuit a considerable electro-motive force may be produced, and by coupling up alternate strips, say, of antimony and bismuth, an instrument known as the thermopile is formed, enabling very small temperatures to be measured, by observing the thermo-electric current. One such

thermopile was used in 1913 to measure the heat given out by some of the fixed stars. A couple made of copper and constantan wires gives a linear relation between E.M.F. and temp. between 0° and 100° C. For higher temps. platinum and platinum-rhodium couples are used.

Thermo-electric Pile. Device for detecting and measuring small amounts of radiant heat. It consists essentially of a number of wires or strips of two different metals or alloys, the ends being soldered together alternately in series, thus forming a battery of thermocouples. The effect produced by one junction is therefore multiplied by the number of thermocouples employed. Normally, the set of junctions exposed to the source of radiation are blackened to give the maximum absorption of heat. When the free ends are connected through a sensitive galvanometer the current flowing in the circuit as a result of the difference of temp. between the two sets of junctions is indicated. The sensitivity of such an arrangement is increased if the hot junctions are placed in a vacuum. The Moll type of surface thermopile, generally employed to provide continuous records of sun and sky radiation, is constructed of thin strips of manganin and constantan, the cold junctions being soldered to relatively large supports. Thermopiles can be calibrated in absolute values against standard radiation.

Thermograph.

Instrument for producing a continuous record of temp. variations. The sensitive element usually consists of either a bimetallic spiral ("Invar"-brass or "Invar"-steel) or a curved metal tube (Bourdon tube) filled with a liquid of low freezing point. One end of the element is fixed rigidly to a frame. In the first instance the bimetal coils or uncoils with change of temperature, and in the second the Bourdon tube alters its curvature. Since the free end of the element is



Thermograph. The instrument which produces a continuous record of temperature variations, showing its principal parts

connected directly or through a lever system to a recording pen, a trace is described on a suitable chart wrapped round a drum which is made to rotate by clockwork. Distant-recording thermographs are generally operated by a special form of Bourdon thermometer in which the change of pressure caused by the expansion of mercury in a steel bulb is communicated to the Bourdon tube by means of a steel capillary tube of fine bore, the bulb and capillary being coated with lead or copper for protection; electrical resistance thermometers and thermocouples are also employed where a very small thermal lag is required. Thermographs for meteorological use are exposed out of doors in a special screen, and sometimes the instrument is adapted to record wet-bulb temperatures as well. At certain meteorological observatories the registration is by photography, a beam of light being directed upon an air bubble in the mercury column of a long stem thermometer and focused on bromide paper.

Thermometer (Greek *thermē*, heat; *metron*, measure). Instrument for measuring temperature, usually by means of the change in vol. of a liquid. Descriptions of apparatus demonstrating the expansion and contraction of air when heated are found in the writings of Philo of Byzantium (3rd century B.C.), and Hero of Alexandria somewhat later. It would appear, however, that the thermometer was not used to measure temps. until the beginning of the 17th century. Its invention is generally attributed to Galileo, who improved its efficiency. These early instruments should be termed thermoscopes. They consisted of a glass flask with a long neck, inverted in a vessel of coloured liquid; some air was expelled from the flask by heating it, and the level of the liquid in the neck varied with the volume of the remaining air. The temp. was expressed by reading an arbitrary scale attached to the neck; but as it was subject to changes in pressure no two instruments read alike. This was overcome by Ferdinand, grand duke of Tuscany, who, about 1641, constructed a thermometer filled with alcohol, the stem being sealed at the upper end and marked in degrees.

In 1714 a new type of thermometer was made by Fahrenheit. He used mercury as a thermometric liquid, replaced the spherical by a cylindrical bulb, thus giving

greater sensitivity, and, most important of all, laid the foundation of a rational scale of temperature. Fahrenheit's scale was based upon three fixed points: the temps. of a mixture of ice, water, and salt, designated 0°; a mixture of ice and water, 32°; and the normal human body, 96°. The b.p. of water was observed to be at 212°. The modern Fahrenheit scale differs slightly from this, but the numbers 32 and 212 are retained for the two fixed reference pts. Later Réaumur devised a scale, from 0° to 80°, based upon the fact that a certain mixture of alcohol and water expands by 80 parts in 1,000 when its temp. is raised from that of freezing to boiling water. This thermometer could not be used up to the b.p. of water, but Réaumur's scale was applied to the mercury thermometer. Celsius, in 1742, proposed a scale with zero at the b.p. and 100° at the freezing point of water. Later it was reversed, producing the present-day Centigrade scale, used internationally in scientific work. Owing to the firm establishment of the Fahrenheit scale in the English-speaking countries, it has not been generally adopted. The Réaumur scale is still used for domestic purposes in some parts of Europe, but is rapidly becoming obsolete. The three scales are inter-convertible by means of the formula

$$C/100 = (F - 32)/180 = R/80.$$

The mercurial thermometer is by far the commonest. It is a glass tube of fine and uniform bore, with a cylindrical or spherical bulb blown or fused on to one end, and closed at the other. The bulb and part of the tube contain mercury; the upper portion may be a vacuum or filled with gas. When the thermometer bulb is immersed in the medium the temp. of which is required, both mercury and glass expand, and the mercury level rises in the tube, which is graduated in degrees. Better types of thermometer are calibrated with reference at least to one fixed point; usually the zero point is chosen. Since the expansions involved are not regular, and since it is rare that the capillary tube is truly uniform in cross-section, corrections have to be determined by separate comparisons, at a number of temperature levels, with an accurate standard.

Mercury has many advantages over other liquids, e.g. it remains liquid over a wide range of temps. (−40° C. to 356° C. under normal atmospheric pressure), can be used in very fine capillaries since it does

not "wet" the walls, and is easily visible. It is not possible to use a mercury thermometer in which the space above the mercury is free from gas to measure temps. above about 250° C., because the mercury boils and splits. This drawback is overcome by filling the space with a gas, usually nitrogen, under pressure; e.g. to extend the range of a mercury thermometer to 450° C., the nitrogen must be at a pressure of 15 atmospheres. For temps. below −40° C. mercury must be replaced by a low freezing-point liquid such as alcohol—generally used for thermometers reading as low as −80° C.—or pentane. Although for a given size of bulb and tube, an alcohol thermometer is more sensitive than a mercury one, it cannot be heated above about 60° C.; hence the upper fixed point cannot be determined directly.

Most thermometers used in meteorology are of the liquid-in-glass type, mercury being preferred when the instrument is not required to register below −30° F. The scale is graduated in whole degrees and is sufficiently open (roughly 15° F. per inch) to allow of estimation of the temperature to within 0.1° F.

Various types of maximum and minimum thermometers have been developed to record fluctuations of temp. The commonest maximum thermometer is that in which the bore of the tube is reduced near the bulb, either by drawing the tube or inserting a small piece of glass, thus offering considerably more resistance to mercury flow than the remainder of the tube. As the temp. rises the mercury expands and is forced past the constriction; a later fall of temp. causes a contraction of the mercury, and the thread breaks. The upper end of the part remaining indicates the highest temp. Clinical thermometers, used to find the temperature of the human body, use this principle, but cover only a short range. The minimum thermometer is a spirit thermometer with a dumbbell-shaped glass index in the capillary. With falling temp. the index is drawn by the spirit towards the bulb, but is left behind when the temp. rises.

Maximum thermometers are set by shaking, when the mercury column joins up again; minimum thermometers by tilting the bulb upwards until the index reaches the meniscus of the spirit.

The measurements of temp. by an ordinary thermometer give an arbitrary scale, and the necessity for some standard scale led Kelvin,

in 1848, to propose a thermodynamic scale, on which the absolute temps. corresponding with 0°C . and 100°C . are 273.1 and 373.1 respectively. It has been shown that a perfect gas, *i.e.* a gas which obeys Boyle's law exactly, between the two thermometrical fixed pts., expands by 100/273 of its volume at the lower point, provided that there is no change of pressure. The apparatus to measure the volume change is termed a gas thermometer, containing hydrogen or nitrogen, the behaviour of which is almost that of a perfect gas. Hence, if temp. be reckoned from a zero which is 273° (more exactly 273.1°) below the Centigrade zero, the volume of a gas, heated under constant pressure, is proportional to the temp. reckoned from this absolute zero of temperature, designated usually 0°K . (Kelvin), *i.e.* 273°K corresponds approximately to 0°C . The gas thermometer is, however, not convenient for ordinary use; it serves mainly as a standard for reference.

Metallic thermometers fall into several classes, and are described under Pyrometer, Thermograph, and Thermo-electric Pile. Electrical thermometers have the advantage that the recording scale (*i.e.* a galvanometer calibrated directly in degrees according to the corresponding temperatures) may be some distance away from the actual thermometer and substance whose temperature is being obtained. See Bolometer; Heat; Temperature; consult also Dictionary of Applied Physics, edited by Sir R. Glazebrook, 1922; Meteorological Instruments, W. E. K. Middleton, 1943.

A. J. Drummond, F.R.Met.S.

Thermoplastics. Term for one of the two main groups into which plastic materials are divided, the other being the thermosetting plastics. The former may be softened and re-softened indefinitely by the application of heat and pressure, provided that the heating is not intense enough to cause chemical decomposition. Natural resins and waxes, cellulosic plastics (*e.g.* ethyl-cellulose), bitumastic products, polystyrene are typical thermoplastics. The thermosetting plastics undergo chemical change on heating and become insoluble and infusible masses; examples of such materials are the phenolic, urea, and casein plastics. Alternative definitions of the two types of plastics are thermohardening and thermo-softening. See Plastics.

Thermopylae. Pass in Greece, leading from Locris into Thessaly,

between Mt. Callidromus and the sea. Thermopylae Pass afforded the only passage for an army from N. to S. Greece, and an heroic effort was made to hold it in 480 B.C. against the invading Persians by a small Greek force of some 1,000 men under Leonidas (*q.v.*), king of Sparta. As the result of treachery, the Persians were enabled to take the Greeks in the rear and shot them down to the last man. The defence of Thermopylae, although unsuccessful, exercised a great moral effect. In 279 B.C. the progress of Brennus and his invading Gauls was stayed at Thermopylae, but the Greek defenders were eventually taken in the rear. In 191 B.C. Antiochus III of Syria was defeated here by the Romans.

When the Germans invaded Greece in April, 1941, the N.Z. div. of the retreating British forces took up their position April 20 in the Thermopylae line, from the sea to the summit of the mts., covering the coast road, and held it until their turn came for evacuation, April 26. See Brennus; Greece. *Pron.* Ther-moppy-lee.

Thermostat. Automatic apparatus or instrument for regulating temperatures, or for giving warning of an undue rise of temperature. It is particularly a device in which the expansion of a metal or a volume of gas acts directly or indirectly through an electric circuit upon an alarm, or to control a source of heat. It is used in conjunction with fire-alarms, for regulating the positions of furnace dampers, controlling steam pressures, etc.

In one form for controlling the temperature of a furnace, it consists of a band of different metals having unequal coefficients of expansion, and carrying at one end an arm which, when in an operative position, engages one of a pair of contacts for opening and closing electric circuits controlling dampers. Variations in the temperature of the band, which is exposed to the source of heat, close one or other of the circuits to open or shut the dampers, and thus control the temperature of the furnace.

In another form, which is applied to a furnace, the movements of mercury in a tube pivoted in the centre of a balanced thermometer cause the thermometer to rise and fall, and thus indirectly control a damper or fire-door. Several other forms depend for their action upon the expansion and contraction of mercury which sets apparatus in motion by controlling electric cir-

cuits. A thermostat for giving an alarm, *e.g.* by ringing a bell, is termed a thermostatic alarm.

Théroigne de Méricourt, ANNE JOSEPHE (1762-1817). French revolutionary. Born in Luxembourg, Aug. 13, 1762, a farmer's daughter, she was living in Paris at the outbreak of the Revolution, took part in the storming of the Bastille, and was accustomed to attend meetings and festivals dressed as an Amazon. She became famous for her inflammatory speeches. She lived in Luxembourg and Liège, 1790, and was arrested for a time by the Austrians, 1791. Opposing Robespierre, she aroused the anger of the mob, being maltreated 1793 by a crowd whom she was haranguing. Losing her reason, she was an inmate of the Salpêtrière from 1794 until her death, June 9, 1817.

Theron. Tyrant of Agrigentum in Sicily. In alliance with his brother-in-law, Gelo of Syracuse, he won a great victory at Himera, 480, over the Carthaginians under Hamilcar. His victory at the Olympic games is celebrated by Pindar. A mild and capable ruler, he was worshipped as a hero after his death.

Thersites. In Greek legend, the ugliest man in the Greek army before Troy. He is represented as a man of the people who delighted in disputing with his superiors. Post-Homeric legend states that he was killed by Achilles for ridiculing that hero's regret at having slain Penthesilea, queen of the Amazons. Thersites has fine opportunities for railing in Shakespeare's Troilus and Cressida. *Pron.* Ther-sight-eez.

Thesaurus (Gr., treasury). Name given, particularly in the 16th-18th centuries, to certain lexicons or word-dictionaries, and also to collections of information on some special subject, *e.g.* Greek and Roman antiquities. An outstanding example is the English work of P. M. Roget (*q.v.*). See Anthology; Dictionary, etc.

Theseus. In Greek legend, the great hero of Attica and Athens. The unacknowledged son of Aegeus, king of Athens, he was brought up at Troezen by his mother. Aethra, who gave him his father's sword and sent him to Athens. Acknowledged by Aegeus as his son and successor, he slew the bull of Marathon, went to Crete, and, helped by Ariadne, killed the Minotaur. On the death of Aegeus, Theseus became king of Athens.

He led an expedition against the Amazons, and married their queen,

Hippolytē, who bore him Hippolytus. With Peirithous, Theseus overcame the Centaurs, and with him carried off Helen from Sparta. Failing to carry off Persephonē from Hades as a wife for Peirithous, Theseus was confined in Hades until released by Hercules. On returning to Athens he found that Helen's brothers, Castor and Pollux, had recovered their sister, while the Athenians had been seduced from their allegiance by Menestheus. Theseus retired to Scyros, and was there murdered by Lycomedes. His alleged bones were brought to Athens in 469 B.C., and a temple was built to receive them. *See* Aegeus; Ariadne; Minotaur.

Thesiger, ERNEST (b. 1879). British actor. Born in London, Jan. 15, 1879, and educated at



Ernest Thesiger,
British actor

Marlborough, he first appeared on the professional stage in Colonel Smith at S. James's Theatre, 1909. He scored a success in *A Little Bit of Fluff*, 1915, playing Bertram Tully more than 1,200 times; and was cast for first productions of plays by Bernard Shaw, e.g. as the Dauphin in *St. Joan*, 1924; and in *Too True to be Good*, Geneva, and in *Good King Charles's Golden Days*. Other memorable parts were in *Mary Rose*, 1920; *The Circle*, 1921; *A Sleeping Clergyman*, 1933; *A Man About the House*, 1946. In films Thesiger was usually a sinister villain. He published a vol. of reminiscences, *Practically True*, 1927; also *Adventures in Embroidery*, 1945. Of his brothers, Admiral Sir Bertram Sackville Thesiger (b. Jan. 14, 1875) was A.D.C. to George V in 1922; and Arthur Lionel Bruce Thesiger (b. Oct. 19, 1872) was a county court judge.

Thesmophoria. In Greek religion, an annual festival in honour of Demeter under her title of Thesmophoros, or bringer of ordinances. An agricultural mystery festival, it was celebrated by free-born women, chiefly at Athens, towards the end of Oct., at the time of sowing. Aristophanes's comedy, *Thesmophoriazousae*, i.e. the women keeping the Thesmophoria, produced 411 B.C., satirises Euripides. *See* Demeter; Mystery.

Thespieae. City of Boeotia, ancient Greece, situated on a slope

of Mt. Helicon. In the Persian invasion of 480 B.C. Thespieae and Plataea were the only two towns of Boeotia to join in the resistance to the invaders. At Thespieae was the famous statue of Eros, the god of the city, by Praxiteles.

Thespis (6th century B.C.). Founder of the Greek drama. He was born at Icaria in Attica, an early seat of the religious worship of Bacchus, in the drunken festivals connected with which Athenian tragedy and comedy originated. In order to give the Dionysian chorus some rest Thespis introduced an actor into these exhibitions, devising a linen mask so that the actor might sustain more than one character. Speaking a poem as the leader of the *Dithyramb*, and addressing speech to the chorus, which replied through its coryphaeus, Thespis thus invented the prologue and the dialogue of Greek drama, while by placing the actor upon a table so that he might be on an equal elevation with the chorus ranged upon the steps of the altar of Bacchus, he introduced the earliest form of the stage. Thespis also devised figures in the dances of the chorus which were known in the time of Aristophanes. *See* Drama; Stage.

Thessalonians, EPISTLES TO THE. Two of the Epistles of S. Paul, usually considered the earliest of his writings. S. Paul visited Thessalonica (Salonika) on his second missionary journey, and made many converts there; but the opposition of the Jews necessitated a hurried withdrawal to Berea. Later he sent Timothy to Thessalonica, and on his return the apostle wrote from Corinth the First Epistle to the Thessalonians. The Second Epistle was written from the same place, not long after the first, which it resembles closely, and both belong to the year 52 or 53. The two epistles are well authenticated.

They were written to strengthen the faith and love of the apostle's converts, at a time when the writer expected the Second Advent to occur in his own lifetime (1 Thess. 4, vv. 13-18). The theme of the speedy "coming of the Lord" is dwelt upon in the First Epistle, and with a view to removing misunderstandings, is further explained in the Second. 2 Thessalonians 2, vv. 1-12, describes events that are to herald the coming of Christ, and is written in a style resembling that of the Book of Revelation.

Thessaloniki. Ancient name revived by the Greeks in 1937 for

the Aegean seaport and city called Salonica (q.v.) in this work.

Thessaly (Gr. Thessalia). District of N. Greece, S. of Macedonia, between Epirus and the Aegean Sea. It consists mainly of the basin of the river Peneus, a depression roughly circular in shape and about 70 m. across, almost entirely surrounded by mts.; the Cambunian Mts. with Olympus, N.; Pelion and Ossa, E.; Ophrys, the modern Helloro, S.; Pindus, W. The only gap is the gorge of Tempe in the N.E. The central plain, though subject in places to floods, now partly controlled, produces much grain, and was famous in antiquity for horse-breeding. In the S.E. the peninsula of Magnesia encloses the land-locked Gulf of Volo. There is rly. communication with Athens and Salonika, and between the chief towns, Larissa, Trikkala, Karditsa, and the port of Volo. It is divided into the nomes of Larissa and Trikkala. Its pop. is 562,020, and area 5,208 sq. m.

Famous in legend as the home of the Argonauts and of Achilles, Thessaly was subdued by the Thesalians from the W. before 1000 B.C., the Aeolian natives becoming the subject class called Penestae. A group of military aristocracies governed the country, only combining when need arose under a *tagos* or military chief. Regarded as half barbarous in classical times, Thessaly favoured Persia, and rose to brief power only when it was united in 374 B.C. by the *tagos* Jason of Pherae, who was murdered in 370. His last successor was overthrown in 352 by Philip of Macedon, who in 344 annexed Thessaly. Thereafter it shared the fortunes of the rest of Greece. Occupied by Vlachs in the Middle Ages, it was called Great Wallachia. It was seized by Venice in 1204, and by Turkey in 1398. Most of Thessaly was ceded to Greece in 1881, and in 1897 it was the chief scene of the Greco-Turkish War.

Thetford. Mun. bor. and market town of Norfolk, England. It is situated at the union of the Thet and the Little Ouse, 14 m. N. of Bury St. Edmunds, and has two rly. stations. Formerly the capital of the kingdom of East Anglia, and later the seat of a bishop, it is an ancient town with several ecclesiastical ruins, including a Cluniac priory, 1104, and a Dominican



Thetford borough
arms

friary, 1340. A unique Saxon kiln was unearthed here, 1949. The grammar school (1556) stands on the site of the old cathedral church of the Trinity. Other buildings are the guildhall, mechanics' institute, almshouses, and in King Street an ancient flint house where Elizabeth and James I were guests. Thomas Paine was a native. The principal trades are making pulp and canning fruit and vegetables; there are also an iron foundry and agricultural machinery works. Adjoining the town is the state forest of Thetford Chase (about 44,000 acres). Thetford was incorporated in 1573, and in 1894

loss occurred because a torpedo-tube door had been left open when the vessel dived. The Thetis was subsequently repaired and recommissioned as the Thunderbolt, but after war service in the Arctic and Mediterranean was reported overdue on April 23, 1943, and presumed lost. Dependants of civilians lost in the Thetis won an action against the makers in 1943, but lost an appeal in 1944 and a further appeal to the house of lords in 1946.

Theuriet, CLAUDE ADHÉMAR (1833-1907). French writer.

He was born at Marly-le-Roi on Oct. 8, 1833, and educated at Bar-le-Duc and in Paris, and was in the civil service, 1857-86. After publishing several volumes of idyllic verse, e.g. *Le Chemin des Bois*, 1867, he turned to fiction, and produced a long series of novels, e.g. *Le Mariage de Gérard*, 1875, Eng. trans. 1906; *Raymonde* 1877; *Le Fils Maugars*, 1879, Eng. trans. 1880, which are especially noteworthy for their descriptions of nature and rustic life. Theuriet became a member of the Academy in 1896, and died April 23, 1907.

Theydon. Name of three parishes in Essex, England. All are near Epping (q.v.). A fourth Theydon has long been known as Coopersale. Theydon Bois (pron. Boys) has a Central line station; its church, S. Mary's, 1851, contains relics of a Jacobean predecessor. Theydon Garnon (or Theydon Gernon) church, All Saints, contains old monuments and brasses, and has a brick tower dating from 1520. Theydon Mount church, S. Michael's, was built 1626; near is Hill Hall, a 16th cent. structure begun by Sir Thomas Smith (1513-77).

Thibaud, JACQUES (b. 1880). French violinist, born at Bordeaux, Sept. 27, 1880. He played the piano in public at six and made a sensational début as a violinist in 1892. Leader of the Colonne orchestra and a concert performer in Brussels, he excelled in chamber music and was particularly associated from 1905 with Alfred Cortot and Pau Casals in a trio.

Tibet. Alternative spelling for the country of Asia described in this work under Tibet.

Thielt. Town of Belgium, in the prov. of W. Flanders. It lies 20 m. by rly. S.W. of Ghent, and is a rly. junction. There are linen, woollen,

lace-making, and brewing industries, and a considerable local agricultural trade. Thielt was fortified in the 12th century, and was a busy centre of the Flemish cloth trade until a great fire in 1383. Pop. 11,611.

Thiépvall. Village of France, in the dept. of Somme. It is on the Ancre river, 4½ m. N.N.E. of Albert. The village, totally destroyed during the First Great War, was prominent in the battles of the Somme (q.v.), and a memorial has been raised there to 73,367 missing Allied soldiers.

Thierry, JACQUES NICOLAS AUGUSTIN (1795-1856). French historian. He was born at Blois, May 10, 1795, and after completing his studies at the École Normale Supérieure, acted for three years



Augustin Thierry, French historian

as secretary to Saint-Simon, under whose influence he wrote his first book, *De la Réorganisation de la Société Européenne*, 1814. He then became a contributor to the liberal journals, in one of which, *Le Courier Français*, appeared his *Lettres sur l'Histoire de France*, published 1827. The *Histoire de la Conquête de l'Angleterre par les Normands*, 1825, at once established his reputation. Though smitten by blindness in 1826, he continued his labours with unabated industry, his later works



Thielt, Belgium. The market place, showing the Cloth Hall with belfry, formerly the centre of a busy cloth trade



Thetford, Norfolk. Gateway of the Cluniae priory, now known as Thetford Abbey

was made the seat of a suffragan bishop in the diocese of Norwich. Market day, Sat. Pop. est. 4,450.

Thetford Mines. City of Quebec, Canada. It stands 70 m. S. of Quebec, on the Quebec Central rly. In the vicinity are asbestos mines (yielding almost 70 p.c. of the world's supply) and chrome iron mines. Pop. 12,716.

Thetis. In Greek mythology, one of the Nereids, or sea-nymphs. She was the wife of Peleus (q.v.) and the mother of Achilles (q.v.).

Thetis. British submarine. Of the Triton class, she had a surface displacement of 1,090 tons on a length of 275 ft. and was armed with ten 21-in. torpedo tubes. Her complement was 53 and she had a submerged speed of nine knots. Laid down in Dec., 1936, she was launched 18 months later. While undergoing trials in Liverpool Bay on June 1, 1939, she failed to surface after submerging, and of 103 men on board, only four survived. The vessel was located by salvage craft, but could not be raised until Aug. 28. At the subsequent inquiry it was established that the

including *Récits des Temps Mérovingiens*, 1840, and *Essai sur L'Histoire du Tiers-État*, 1853. He died May 22, 1856.

An ardent admirer of Scott, Thierry belonged to the romantic school of historians. But though he indulged freely in picturesque description and local colour, he did not sacrifice scholarship to effect. His ambition was to combine art with science, and to weave a dramatic narrative out of materials furnished by painstaking research. *Pron.* Tee-si-ry.

Thiers. Town of France, in the dept. of Puy-de-Dôme. Lying 24 m. E.N.E. of Clermont-Ferrand, it comprises an upper and a lower town, the latter situated in a nearly sunless gorge. Known as the Black City, it is the scene of a romance entitled *Ville Noire*, by George Sand. The upper town is quaint and picturesque, and crowns a granite hill, Mt. Besset, at the foot of which flows the Durdolle river. Here are the 11th century Romanesque-Gothic church of S. Genès, and the 7th century Romanesque church of Le Moutier. The town owes its industry to water power, which drives grindstones, hammers, paper mills, and forges. Pop. 15,409.

Thiers, Louis Adolphe (1797-1877). French statesman and historian. Born at Marseilles, April 14 or 16, 1797, of humble origin, he studied law at Aix, and becoming an advocate made his way to Paris, where he wrote for the *Constitutionnel*, attended political salons, and worked on his *History of the French Revolution*, the first volumes of which appeared in 1823. With Carrel he founded *Le National*, in which he fought for constitutional liberty, and after the revolution of 1830 proposed Louis Philippe as successor to Charles X.

Taking office under his friend Laffitte, the banker, Thiers made his mark as a debater and financier, while his literary status was recognized by election to the Academy in 1834. During 1832-36 as minister of the interior he took drastic measures against the revolutionaries. President of the council as leader of the Left Centre for short periods in 1836 and 1840, when his foreign policy brought Europe to

the verge of war, he was in opposition till the revolution of 1848. During this comparative retirement he added to his literary reputation with early volumes of his *History of the Consulate and Empire*. The *coup d'état* of 1851 involved his arrest and exile to Germany, but though he returned to Paris next year, he did not re-enter politics till 1860, when as a member of the Corps Législatif he came forward as a severe critic of policy at home and abroad.

After the fall of the empire, 1870, Thiers again came to the front, being elected to the assembly by 26 departments, with an aggregate vote of about 1,000,000. Regarded as France's only hope, at the age of 73 he visited neutral countries to urge their intervention, and also parleyed with Bismarck at Versailles, but in vain. As president of the executive government he faced the tremendous task of reorganizing France, putting down the Paris Commune, and freeing the soil from the invader by speedy payment of the war indemnity. Virtually dictator, he used his power wisely in the true interests of peace, loyally supporting the republic; but in May, 1873, not long before the final payment of the indemnity, he was driven from office by a Monarchist and Radical coalition, and retired into private life. Thiers died Sept. 3, 1877. *See* Bismarck. *Consult* The Government of Thiers, J. F. Simon, Eng. trans. 1879; *Life*, P. de Rémusat, Eng. trans. 1892; *Monsieur Thiers*, J. M. S. Allison, 1932. *Pron.* Tee-air.

Thiès. Town of Senegal, French W. Africa. Just E. of Dakar, it is a rly. junction for St. Louis on the coast and Kayes inland. Pop. 22,950.

Thimble (A.S. *thýmel*, thumb-stall, from *thúma*, thumb). Cap or cover for the finger to protect it in pushing a needle through material. Originally worn on the thumb, thimbles are now usually worn on the middle finger of the right hand. They are made of silver and other metals, bone, celluloid, plastic material, and are covered with small indentations to prevent the end of the needle from slipping. A tailor's thimble is open at the end.

A *thummel*, or sailmaker's thimble, is a heavy ring worn on the thumb, bearing a disk for pressing the needle. In nautical terminology, a thimble is a concave metal ring grooved on the outside so as to fit within an eye-piece. The term is used of many



Thimble. Portion of a sailmaker's thummel. Top, left, tailor's thimble; right, household thimble

mechanical appliances, e.g. a sleeve or tube through which a bolt passes, a ferrule to expand a flue tube, and a metal socket for fixing lead pipes to stone.

Thingvall Vatn. Lake of S.W. Iceland. Situated 24 m. E. of Reykjavik, the capital, it covers an area of about 30 sq. m. In the vicinity of the N. end is Thingvellir, where the ancient althing, or local parliament, assembled.

Thio-derivatives. Series of chemical compounds analogous to the alcohols, but containing sulphur in place of oxygen. These are known as thiols, thio-alcohols, or mercaptans. Thio-ethers, or alkyl sulphides, are liquids possessing an unpleasant odour of leeks. Thio-alcohols may be made by heating alcohol with phosphorus pentasulphide, the ethers being prepared by an analogous method.

Thionville (Ger. Diedenhofen). Town of France. In the dept. of Moselle, it stands on the Moselle, 17 m. N. of Metz, and is a rly. junction and a centre for the sale of agricultural produce. An important place in the days of the Franks, it was in the duchy of Lorraine, was acquired by France during the wars of Louis XIV, was taken by the Prussians in 1870, and remained German until 1918. During the Second Great War, possession of Thionville was violently disputed. U.S. forces advancing from Verdun secured the part of it W. of the Moselle by Sept. 14, 1944; but the part E. of the river remained in German hands until isolated on Nov. 15 by the linking of American troops which had crossed the river to the N.E. near Königsmacher on the 9th, and to the S.W. near Uckange on the 13th. Pop. 17,596.



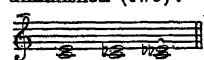
Of Thiers
(A. Thiers)

Thiophene (C_4H_4S). Colourless liquid which occurs with benzene distilled from coal tar. For the preparation of thiophene commercial benzene is shaken up with strong sulphuric acid, when a black acid layer is formed. This sulpho-acid is converted into the lead salt, mixed with ammonium chloride (sal ammoniac), and distilled. *See* Coal Tar.

Thiosulphuric Acid ($H_2S_2O_3$). Acid which has not been prepared in a pure state, but the salts of which are made. The most important is sodium thiosulphate, generally but erroneously called hyposulphite of soda, which is used in industry for destroying the last traces of chlorine after bleaching.

The property of sodium thiosulphate of dissolving silver chloride and iodide recommends it to photographers as a fixing agent. When a photographic plate is acted upon by light and developed, those silver salts which the light reaches are reduced to the metallic state. If now the plate is immersed in a solution of sodium thiosulphate, the unaffected silver chloride and iodide are dissolved away, and the metallic silver which is insensitive to light is left in the emulsion, thus fixing the negative. *See* Photography.

Third. In music, an interval comprising three letter names. It is of three kinds: major (four semitones), minor (three), and diminished (two):



The major and minor thirds are

important because their occurrence in the scale determines the mode of the key.

Third Degree. Colloquial term for methods used by police in the U.S.A. to extract confessions from arrested persons. It may take the form of continuous questioning over a long period, depriving of sleep, starvation, confinement in a dark cell, beating with a rubber hose or black-jack, or kicking in the stomach. The term is believed to have been suggested by the three degrees in the initiation of freemasons. Such practices are prohibited in the police forces of Great Britain.

Third Estate (Fr. *tiers état*). Name given to the class in France which, though neither nobility nor clergy, was entitled to send deputies to the states-general. The name is especially prominent in the history of 1789-90, when these deputies were helping to frame a constitution. *See* Estates; French Revolution.

Third International. The formation and history of this association of Communist parties is given under International.

Third Party. Term used in English law. Where there are two persons in a definite relation to each other, and someone else is brought on the scene, the latter is spoken of as the third party. Thus, if a principal and his agent are the two parties spoken of, and the agent introduces someone to do business with his principal, this last person is a third party. Third party insurance against certain risks is obligatory upon the user of a motor vehicle.

Third Programme. Broadcasting service inaugurated by the B.B.C. on Sept. 29, 1946. It was designed not exactly to supplement the existing home and light programmes, but as a cultural experiment, since the director-general of the B.B.C. acknowledged that its appeal would be to a minority of listeners. Not having to stop a feature at any given time in favour of e.g. a news bulletin, the third programme could run an entire opera or classical drama. It also revived much first-class but neglected music and poetry, and gave encouragement to contemporary composers and writers who had previously found radio an inaccessible medium.



Third Reich. Term applied to the Hitler regime in Germany, the word Reich being German for realm. The law which actually reconstituted the Reich was enacted Feb. 1, 1934. The word third alluded to the fact that Germany had been first a monarchist empire, 1871-1918, and then a federation of states under the Weimar constitution. *See* Germany; History.

Third Republic. Name given in France to the period from Sept. 4, 1870, to June 17, 1940. After the disasters of Metz and Sedan, Napoleon III was declared deposed and the republic was proclaimed. Its chief authors were Gambetta and Thiers. It ended with the capitulation of the French govt. in the Second Great War. *See* France: History; Gambetta; Napoleon III; Thiers.

Thirkell, ANGELA MARGARET (b. 1890). British novelist. She was born in London, Jan. 30, 1890, daughter of J. W. Mackail (*q.v.*) and Margaret Burne-Jones. Denis Mackail (*q.v.*) was her brother. In Australia she broadcast and contributed to magazines, and on her return to England in 1930 speedily made a name with amusing and sometimes slightly fantastic novels, often in an English village setting. Her first was *Three Houses*, 1931; the first to be widely praised was *Wild Strawberries*, 1934. Then came *The Brandons*, 1939; *Marling Hall*, 1942; *Peace Breaks Out*, 1946; *Love Among the Ruins*, 1948.

Thirlage (cognate with Eng. *thrall*, a slave). Term in old Scots law. It was applied to a tenure of land, the holder of which was obliged to have his grain ground at a specified mill, paying therefor a certain portion of the flour. Since

the end of the 18th century thirlage has been commuted for an annual payment.

Thirlmere. Lake of Cumberland, England. Lying under Helvellyn, 5 m. S.E. of Keswick, it is a narrow sheet of water about $3\frac{1}{2}$ m. long. On the W. side are the Armboth Fells. Since 1894 the lake has been one of the sources whence



Thirlmere. The Cumberland lake before it was made the reservoir for Manchester. The water level was raised 50 ft. by building a large dam at its foot, the area being extended as shown in the top picture

Manchester obtains its water supply. The heavy rainfall, 91 ins. annually, drains from 10,000 acres of land into the 800-acre lake. The water flows by gravitation to supply over 1,000,000 people 100 m. away. See Cumberlan; Lake District; Manchester.

Thirlwall, CONNOP (1797–1875). British divine and historian. Born at Stepney, Jan. 11, 1797, he was educated at the Charterhouse



Connop Thirlwall,
British divine

and Trinity College, Cambridge, and, having been ordained, became in 1832 a tutor at Trinity. Here signed in 1834 because he had expressed himself in favour of the

removal of religious tests. In 1840 he became bishop of St. David's, and remained in Wales for 34 years. He was the only bishop to refuse to censure Colenso. He died July 27, 1875, and was buried in Westminster Abbey. Thirlwall's History of Greece, 1835–47, is a standard work. Consult his Remains, ed. J. J. S. Perowne, 1877–78; Letters, ed. Perowne and L. Stokes, 1881.

Thirsk. Market town of the N. Riding of Yorks, England. It is 22 m. by rly. N.W. of York. The chief building is the beautiful Perpendicular church of S. Mary. There are works for making farm machinery; flour mills and tanneries; and cardboard boxes are made. Race meetings are held four times a year. Thirsk and Malton is the name of a co. constituency. Market day, Mon. Pop. 2,658.

Thirst. Sensation arising from the demand of an organism for water. It is felt chiefly in the regions of the throat and mouth, possibly because of evaporation from their surface. The sucking of a stone or hard sweet may ease the condition by local reaction, although no fluid is given.

Abnormal thirst may be caused by the fact that large quantities of substances such as salt or sugar have been swallowed. These alter

the concentration of the tissue fluids. It is also experienced in diseases which alter the fluid chemistry, e.g. diabetes, or which result in excessive loss of fluid, e.g. haemorrhage or diarrhoea. When the body fluids have been depleted, or when a man has gone for a long period without drink, fluid must be given drop by drop, or by a slow intravenous or rectal drip.

Thirty-Nine Articles, THE. Colloquial term for the Articles of Religion printed at the end of the Anglican Book of Common Prayer. They constitute a formulary of faith such as was found necessary by all Protestant bodies in the 16th century, having parallels in the Schwabach Articles, 1529; Augsburg Confession, 1530; and Confession of Württemberg, 1552. Like these, they were drawn up to combat the dogmas and claims of Rome, but were designed to prevent diversities of opinion within the Anglican Communion. All candidates for ordination subscribe to their contents as a whole, and they are regarded as binding on the lay members of the Church of England, and form part of the statute law of England, and of the canon law of the Church. Until 1871 subscription was obligatory on all taking degrees at Oxford and Cambridge.



Thirsk, Yorkshire. Parish church of S. Mary

Historically, the conditions which made such formalities necessary were similar to those ruling in the 4th and 5th centuries, when the whole Church Catholic formulated the Apostles' and Nicene Creeds. The XXXIX Articles were arrived at gradually. First came the Ten Articles of 1536. These were followed by The Institution of a Christian Man, 1537, called The Bishops' Book because it lacked other authority; The Thirteen Articles, 1538, drawn up by Cranmer on the basis of the Augsburg Confession; The Law of the Six Articles, agreed to by parliament and Canterbury through the in-

fluence of Gardiner in 1539; and The Necessary Doctrine and Erudition for Any Christian Man, 1543, known as The King's Book.

Of The Forty-two Articles issued with royal approval in 1553, a revision of those drawn up by Cranmer, 1549–51, six were virtually identical with parts of the Augsburg Confession. They were followed by The Eleven Articles of Archbishop Parker, 1559–60, and The Thirty-Eight Articles of 1563, an episcopal revision of The Forty-two of 1553. Of the articles submitted in 1563, one, which dealt with unworthy reception of the Holy Communion, had been struck out by Elizabeth or by her authority. This was reinstated in the XXXIX, as finally revised in 1571, largely by Bishop Jewel. Parliament enacted the English, but not the Latin, version.

The declaration which precedes the Articles was drawn up by Laud in 1628, and enjoins their interpretation in a literal and grammatical sense; but since the Tractarian movement, while the High Church party holds that they are not religious tests, extreme Protestants contend for their literal interpretation.

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Thirty-one. Card game played with a full pack, and by any number of persons up to 16. Three cards are dealt to each player, and an extra hand is laid face upwards in the centre of the table. Beginning with the elder hand, the participants exchange in turn one card for one in the spare hand, the object being to obtain a combination of three cards which shall make 31 points, or as near as possible, in any one suit, an ace counting 11, each court card 10, and the remainder according to the number of pips. After a player has "knocked," the others may change once each. Either the holder of the highest hand wins the pool, or the holder of the lowest loses a "life."

Thirty Tyrants, THE. Oligarchy established by Lysander (q.v.) at Athens after the taking of the city by the Spartans in 404 B.C., the last act of the Peloponnesian War (q.v.). This oligarchy, the leading and worst member of which was

Critias, proved most oppressive and cruel, causing hundreds of citizens to be thrown into prison without a trial. A democratic form of government was restored in the spring of 403. See Athens.

Thirty Years War, THE. European war which raged over almost all Germany from 1618 to 1648. Primarily it was a contest between the forces of Roman Catholicism and Protestantism, a civil war in the German Empire; it did not remain so exclusively, because the religious question was complicated by a purely political question, and because non-German powers participated.

In 1618 Bohemia rejected the succession of the future emperor Ferdinand II to its crown, offered it to the Calvinist Frederick, the elector palatine, and defied the imperial legates' authority. Frederick's acceptance opened the war. In its first phase this was a contest for the crown of Bohemia. Ferdinand was supported by the R.C. princes and by Spain, then in possession of the Netherlands.

The Protestants failed to combine in support of Frederick, who suffered a heavy defeat at the White Mountain, Nov. 8, 1620, and was driven out of the Palatinate. James I of England, after vainly attempting diplomatic intervention on behalf of his son-in-law, Frederick, sent a blundering expedition against the Spanish Netherlands, 1625.

It was left to Denmark to attempt in 1626 to organize and maintain Protestant resistance, since both Saxony and Brandenburg held aloof. For a moment it seemed that Ferdinand's position was insecure, that his army under Tilly would have too much on its hands. The position was saved by Wallenstein, who procured Ferdinand's authority to raise an army of his own, which under his leadership rapidly dominated the military situation and seemed likely to crush resistance. Great as were his successes, he was hampered by the action of the League, under pressure from whom Ferdinand in 1629 issued the Edict of Restitution, restoring all ecclesiastical sees to Roman Catholics.

In 1630 Wallenstein was deprived of his command, and in the same year Gustavus Adolphus, king of Sweden, landed in Pomerania to champion the Protestant cause. For a time he was held inactive by the persistent abstention of Saxony and Brandenburg; he was thereby prevented from saving the city of Magdeburg, which after

a famous resistance was stormed and sacked, May 20 (N.S.), 1631, with hideous savagery by Tilly's troops. At last Brandenburg and Saxony were driven to giving their adherence to Gustavus, who started upon a brilliant career of victory, overthrowing Tilly at Breitenfeld, Sept. 17, sweeping round through the W. and S. of Germany, and mortally wounding Tilly at the battle of the Lech, April 15, 1632. Ferdinand was again compelled to call Wallenstein to the rescue from his retirement. Gustavus met the latter at Lützen, Nov. 16, 1632, and fell there by an unknown hand, but the Swedes won the victory.

Confusion of Aims

From this time the war became a chaos. The Swedes, no longer led by an idealist, were mainly concerned with the acquisition of territory; Richelieu meant to turn the German war to French advantage by the extension of borders. German princes great and small were more interested in aggrandisement than in the common cause whether of Protestantism or of Roman Catholicism. The one really great personality left on the stage was removed by the assassination of Wallenstein in 1634. In 1637 Ferdinand II was succeeded by his son Ferdinand III. The most prominent of the Protestants, Bernard of Saxe-Weimar, died in 1639; and Alsace, of which he had just made himself master, passed into the possession of France. In the N. and E. the Swedes, under able commanders, Baner, Torstenson, and Wrangel, won victories but could not consolidate conquests. Condé and Turenne achieved fame in command of French troops in the Netherlands and in S. Germany.

But the welter of fighting had ceased to have any common objects at stake, and the whole evil business was at last brought to a close in 1648 by the series of agreements known as the treaty of Westphalia, which left German lands in the possession both of Sweden and of France, and largely redistributed the territories of German princes. See Europe; Germany; Gustavus II; Protestantism; Richelieu; Wallenstein; Westphalia, Treaty of.

Bibliography. Schiller's popular history, 1791, remains a standard work. Consult also that of S. R. Gardiner, new ed. 1900; Camb. Mod. Hist., vol. 4, 1906.

Thisbe. In Babylonian legend, heroine of the love tragedy of Pyramus and Thisbe. See Midsummer Night's Dream; Pyramus.

Thisted. Seaport of Denmark, in N.W. Jutland. It stands on the Liim Fjord (q.v.), 12 m. direct N.N.W. of Nykjöbing, and is connected by rly. with Aalborg. There are shipbuilding yards and cotton-spinning works. Pop. 9,425.

Thistle. Common name applied to many prickly plants, but more strictly to those of the genus



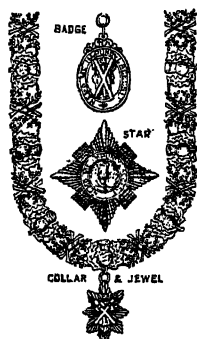
Thistle. Flower-head, spiny leaves, and bud of the red musk-thistle

Carduus of the family Compositae. These are perennial or biennial herbs, forming large rosettes of spiny leaves the first year, and developing prickly stems the second year. The small red or purple florets are all tubular, massed in an oval or a roundish head, which is invested in overlapping, rigid, and spiny bracts.

The seeds have each a tuft of silky hairs (thistledown) attached, which buoys them in the air and assists distribution. The most striking species are the nodding or musk-thistle (*Carduus nutans*) with drooping, musk-scented, crimson flowers; spear-thistle (*C. lanceolatus*) with long spines to the large, lance-shaped leaves, and purple flowers; the dwarf-thistle (*C. acutis*) with the stem more or less suppressed, and the crimson flowers in the centre of the flat rosette of leaves; and the field-thistle (*C. arvensis*) with thick creeping underground stem and dark purple flowers—one of the greatest pests of agriculture. The holy- or milk-thistle (*Silybum marianum*) has huge leaves netted with white veins, and rosy-purple flowers. See Carline-thistle; Cotton Thistle; Inflorescence; Pollen; Sow-thistle.

Thistle, ORDER OF THE. Scottish order of knighthood. It was founded in 1687 by James VII, although a much earlier origin is claimed. It consists of the sovereign and 16 knights. The knights wear a collar of thistles, alternating with double sprigs of rue in saltire

in their proper colours and pendant therefrom a golden star of eight rays, called the glory. There-



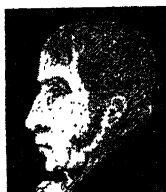
Thistle. Insignia of the Order

on is the figure of S. Andrew, in green and purple cloak, holding in front of him a white saltire. The ribbon is green and the motto is *Nemo me in p u n e lacessit* (No one attacks me with impunity). The

order has a dean and a chapel in S. Giles's cathedral, Edinburgh. See Knighthood colour plate.

Thistlewood, ARTHUR (1770-1820). British conspirator. Born at Tupholme, Lincs, he served in the army, travelled abroad, and then settled in London, where he joined the malcontents who aimed at revolution. In 1816 he was arrested for his share in an unsuccessful rising, but was acquitted and forthwith continued his plots, though going to prison for a year for challenging Sidmouth, Home secretary, to a duel. In 1820 he organized the plot known as the Cato Street conspiracy (*q.v.*). On Feb. 23 he and his associates met in a room in Cato Street (now Horace Street), Edgware Road, to plan the murder of the cabinet ministers who were dining in a house in Grosvenor Square. The scheme was betrayed, and though Thistlewood escaped, he was taken the next day and with four others was hanged for high treason on May 1.

Tholen or TOLEN. Island of the Netherlands, in the prov. of Zeeland. It lies in the Schelde estuary, separated from the island of S. Beveland by the E. Schelde and from the mainland by the Eendracht. The island is about 10 m. long by 6½ m. broad, flat and low-lying. Tholen is the chief town and has a 15th century Gothic town hall and a Gothic church; Stavenisse and St. Maartensdijk are other towns. Fishing and spinning are carried on. Tholen in medieval



Arthur Thistlewood, British conspirator

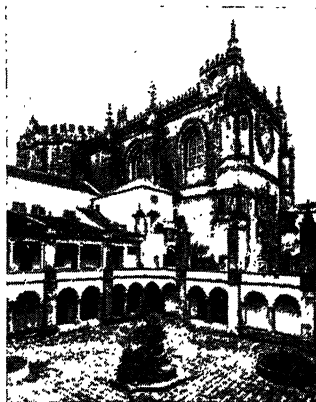
times consisted of numerous small islets which have been united artificially. In 1825 the island was completely submerged by a storm.

Tholuck, FRIEDRICH AUGUST GOTTREV (1799-1877). German theologian. Born at Breslau, March 30, 1799, and educated there and in Berlin, he was appointed professor of Oriental languages in Berlin, 1824, and two years later was called to the chair of theology at Halle, where he died June 10, 1877. Author of Commentaries on Psalms, John, and the Romans, he was a great preacher and evangelical theologian.

Thomar or TOMAR. Town of Portugal, in the dist. of Santarem, Estremadura. It stands on the river Nabão, a tributary of the Tagus, 16 m. N.W. of Abrantes and 89 m. by rly. N.N.E. of Lisbon on the Oporto line. The town, which occupies the site of the ancient Nabantia, grew up round the castle of the Knights Templars, entrusted to them in 1159, and in a ruinous condition. The convent palace of the Knights of Christ includes two churches, three old cloisters, a chapter house, four new cloisters, extensive dormitories, and other buildings, the whole being an epitome of Portuguese architecture from the 12th to the 17th century. Water is conveyed to the town by a 3-mile aqueduct, dating from the end of the 16th century. Among other features of interest is the palace of Henry the Navigator. Alvaid died in the town. Thomar is noted for its wine. Pop. 8,500.

Thomas. Masculine Christian name. An Aramaic word, it means twin, and became popular because it was the name of one of Jesus Christ's disciples. There is a popular abbreviation Tom, and feminine variants of Thomasina.

Thomas. One of the twelve apostles. His name, which, like his Greek designation Didymus, means twin, is really an epithet, and his proper name is said to have been Judas. He showed courage in calling on the other apostles to follow Our Lord into Judaea in the face of danger (John 11, v. 16), and although he would not believe the resurrection without ocular demonstration, yet when that was granted he made a great confession of faith (John 20, vv. 19-29). According to tradition, he preached in Parthia, and was buried at Edessa. Later stories made him the founder of a church in India. The apocryphal Gospel and Acts of Thomas are Gnostic fabrications. His festival is Dec. 21.



Thomar, Portugal. A part of the Convent palace of the Knights of Christ, the whole including many cloisters and two churches

Thomas, ALBERT (1878-1932). French administrator. This baker's son, born June 16, 1878, at Champigny-sur-Marne, went to the École Normale Supérieure and won a travelling scholarship. In 1903 his book on German syndicalism attracted wide attention. Becoming a disciple of Jaurès, he was elected a Socialist deputy for Sceaux in 1910, specialising in matters relating to rlys., mines, and finance. Almost throughout the First Great War he was minister of munitions. He opposed French intervention in Russia after the 1917 revolution. In 1920 he resigned from the chamber to become director of the international labour office in Geneva. In this position he left a deep impression on international economic affairs, working to improve industrial conditions. Thomas died May 8, 1932. *Pron.* Toe-mah.

Thomas, ARTHUR GORING (1850-92). British composer. Born near Eastbourne, Nov. 20, 1850, he



A. G. Thomas, British composer

studied music in Paris and under Sullivan at the Royal Academy of Music, 1877-80. His operas include Esmeralda, produced at Covent Garden, 1883; Nadeshda, 1885; and the comic opera, The Golden Web, posthumously produced in 1893. His choral ode, The Sun Worshipers, was presented in 1881, and his lyric gift was well displayed in songs. Thomas suffered from melancholia, and committed suicide by throwing himself in front of a train, March 20,

1892. A scholarship bearing his name was founded at the R.A.M.

Thomas, BRANDON (1849-1914). British playwright. Born at Hull, he worked as a shipping clerk in Liverpool and Hull before going on the stage in John Hare's company in 1879. He acted in comedy parts in England and the U.S.A., but was more successful as a playwright. His greatest triumph was his farce, *Charley's Aunt*, which, produced Dec. 21, 1892, ran for 1,466 performances, and was frequently revived, as well as being a favourite play for amateur performance. Among his other plays were *The Colour-Sergeant*, 1885; *A Judge's Memory*, 1906. Brandon Thomas died June 19, 1914.



Brandon Thomas,
British playwright

Thomas, (CHARLES LOUIS) AMBROISE (1811-96). French composer. Born at Metz, Aug. 5, 1811, he gained the *prix de Rome* in 1832, and in 1837 produced his first opera, *La Double Echelle*. Of his other pieces the best known are the overture to *Raymond*, 1851, and *Mignon*, 1866. *Hamlet*, 1868, was also popular, and in 1871 Thomas became director of the *Paris conservatoire*. His last opera, *Françoise de Rimini*, was produced in 1882, and he died Feb. 12, 1896. *Pron.* Toe-mah.

Thomas, SIR GEORGE ALAN (b. 1881). British chess and badminton player. He was born June 14, 1881, educated at Wellington, and succeeded to his father's baronetcy in 1918. Of international rank as a chess player, he won the British championship in 1923 and 1934 and could still finish runner-up in 1948. In English badminton championships he won the singles four years in succession from 1920, and nine doubles titles.

Thomas, GEORGE HENRY (1816-70). American soldier. Born in Virginia, July 31, 1816, and educated at West Point, he served in the Mexican War, and on the outbreak of the Civil War, though a Southerner by birth, adhered to the Union, and was given



George H. Thomas,
American soldier

command of a brigade. His first success was the victory of Mill Springs in 1862. In 1863 he commanded a corps in the campaign of Middle Tennessee, and by his stand at Chickamauga neutralised the Confederate success. He succeeded Rosecrans in command of the army of the Cumberland, and in 1864 defeated Hood at Nashville. He died at San Francisco, March 28, 1870.

Thomas, JAMES HENRY (1874-1949). British politician and labour leader. Born Oct. 3, 1874, at Newport, Mon., of humble parentage, he began life as an errand boy at the age of nine, and became first a greaser, then a fireman and engine-driver on the Great Western rly. His union, the Amalgamated Society of Railway Servants, appointed him organizing secretary, and he became assistant sec. in 1910, the same year in which he entered parliament as Labour M.P. for Derby. He helped materially in the transformation of his union into the National Union of Railwaymen, acting as general secretary of the new body from its foundation in 1918 until 1931, except for the brief period of the first Labour govt., 1924. He served as president of the international federation of trade unions, 1920-24, and as president of the parl. committee of the T.U.C., 1920-21. Made a privy councillor in 1917, he declined office in Lloyd George's coalition govt., but was appointed secretary for the Colonies in the first Labour govt., 1924, and lord privy seal in that of 1929, with special tasks in relation to the problem of unemployment. Unsuccessful in his efforts to solve that problem, he went to the Dominions office in May, 1930. When the economic crisis of 1931 split the Labour party, he remained a supporter of MacDonald, as a member of the National Labour party, and continued as Dominions secretary in the National govt. His handling of the Irish land revenues antagonised the Eire govt. In the spring of 1936 an inquiry into Budget disclosures was held under the Tribunals of Enquiry (Evidence) Act, and as a result of the report Thomas resigned his office and seat, retiring from public life. He died Jan. 21, 1949. An autobiography, *My Story*, appeared 1937.



J. H. Thomas,
British politician

Thomas, SIR PERCY EDWARD (b. 1883). Welsh architect. He was born in Cardiff, Sept. 13, 1883, and joined a local firm of architects. In 1911 he secured a scholarship to Cardiff Technical college. He designed many public buildings, including Swansea civic centre and the temple of peace at Cardiff. He was president of the R.I.B.A., 1935-37 and 1943-46. In 1946 he received a knighthood.



Edward Thomas,
British poet

Thomas, (PHILIP) EDWARD (1878-1917). British poet and essayist.

Born March 3, 1878, to Welsh parents in London, he went to several schools, including S. Paul's, and published *The Woodland Life*, 1897, before going to Lincoln College, Oxford. For years he subsisted on hack journalism, but books he was commissioned to write, biographies or country subjects, revealed a fine prose style, e.g. *Oxford*, 1903; *The South Country*, and *Life of Richard Jefferies*, both 1908; *The Icknield Way*, 1913. Collected essays later appeared as *Rest and Unrest*; *Light and Twilight*. Edward Thomas turned to poetry, under Robert Frost's influence, only with the outbreak of war, and that at first pseudonymously as Edward Eastaway; and when he was killed at the third battle of Arras, April 9, 1917, probably a tithe of his potentiality had been realized. His pieces, sensitive, melancholy, of the slightest texture, follow direct speech rhythms as often as they are metrical; his subjects and moods are suggested by country names of plants or places. His longest and favourite poem was *Lob*; most quoted is *Adlestrop*; *Lights Out* is a gem. His biographer is John Moore (Life and Letters, 1939); his widow, Helen Thomas, wrote *As It Was*, 1926.



S. G. Thomas,
British metallurgist

Thomas, SIDNEY GILCHRIST (1850-85). British metallurgist.

Born in London, April 16, 1850, he early applied himself in his spare time to the study of chemistry. From this he was led to the important invention of his life, the

elimination of phosphorus in the Bessemer and Siemens-Martin processes of converting pig iron into steel. By careful study he evolved the basic lining to the Bessemer converter, an invention that was epoch-making. He died Feb. 1, 1885. *See* Thomas-Gilchrist Process.

Thomas, Sir William Beach (b. 1868). English writer. He was educated at Shrewsbury School and Christ Church, Oxford. He became widely known as a war correspondent during the First Great War. His book, *With the*



Sir W. Beach Thomas,
English writer

British on the Somme, appeared in 1917, and in 1925 *A Traveller in News*. He was made K.B.E. in 1920. Later he became widely known as the author of many articles and books on nature study and the topography of the countryside, contributing regularly on these subjects to the *Observer* and the *Spectator*. Among his books were *Village England*, 1935; *The Way of a Countryman*, 1944; *A Countryman's Creed*, 1946.

Thomas, Christians of Saint. Christian church in Malabar, S. India. Its existence is first reported by Cosmas Indicopleustes in the 6th century. It claims to have been founded by S. Thomas the apostle, and regards another Thomas who came from Jerusalem, A.D. 345, as its second founder. It is a Nestorian church, using a Syriac liturgy, and was probably a branch of the ancient church of Persia. The church of S. Thomas submitted to Rome in 1599, but became again independent in 1653, and soon after joined the Jacobite communion. By the 20th cent. its adherents were fewer than 500,000.

Thomas Coram Schools. Name of the institution founded as the Foundling Hospital (*q.v.*).

Thomas-Gilchrist Process. Modification of the original Bessemer process of steelmaking. Highly phosphoric pig irons can be refined by it to steel. It was devised by Sidney Gilchrist Thomas, a magistrate's clerk in London, with his cousin Percy Gilchrist, a chemist at Blaenavon, where the process was first tried about 1877. Often it is described as the basic Bessemer process, because the lining of the converter is basic in character, usually dolomite, com-

pared with the acid silica lining of the original.

The pig iron to be treated, which should be low in silicon and sulphur, but high in manganese and phosphorus, is poured molten into the converter, and air is blown through the metal to oxidise the impurities. The silicon is first removed, followed by carbon, while manganese is gradually removed. Oxidation of the phosphorus occurs in the "after-blow" period, and this must be carefully timed to prevent over-oxidation of the steel. After this the blowing of air is stopped, deoxidisers are added, and the steel is recarburised before tapping. The basic slag produced, high in phosphorus, is valued as a fertiliser. Although invented in Great Britain, the process was first used extensively on the Continent. The phosphoric ores of England were unsuitable because of their high silicon and sulphur content. The Brassart process of desulphurising pig iron by means of sodium carbonate has extended the use of the Thomas-Gilchrist process. *See* Bessemer Process.

Thomas the Rhymer or **THOMAS RYMOUR** (*f.* c. 1270). Scottish seer and poet. He lived at Erceldoune, now Earlston in Berwickshire, whence he is also called Thomas of Erceldoune. He is supposed to have foretold the death of Alexander III in 1286, and a great mass of prophetic sayings became associated with his name; some are to be found in *The Whole Prophecies of Scotland* (Bannatyne Club ed. 1833). According to legend, Thomas was beloved of an elf queen, by whom he was carried off to Elfland, returning after three years with the gift of prophecy. This legend is the subject of *The Romance of Thomas of Erceldoune*, to which are added a number of prophecies; also of several beautiful ballads. Some critics ascribe Sir Tristram, a romance of the Arthurian cycle, to Thomas, but this is much disputed. *Consult* *Romance and Prophecies of T. of E.*, ed. J. A. H. Murray, 1875.

Thomond. Ancient dist. of Ireland, covering the N. part of the prov. of Munster. It gave its name to the earldom of Thomond, borne by the family of O'Brien, descendants of Turlough O'Brien, the 11th century king of Munster. Connor O'Brien became prince of Thomond in 1528, and was succeeded by his brother Murrrough (d. 1551) in 1540. The latter offered submission to Henry VIII, who made him earl of Thomond in 1543. Donough (d. 1624), 4th earl, an

able soldier, received the presidency of Munster, 1605. On the death of Henry, 8th earl, in 1741, the title became dormant. A marquessate of Thomond, created in 1800 for the earl of Inchiquin, died out in 1855. *See* Munster.

Thompson, Edward John (1886-1946). British writer and poet. Born Dec. 28, 1886, he was educated at Kingswood school, Bath, and London university. Entering the Methodist ministry, he went to India in 1910 as an educational missionary, being at Bankura College. Service as chaplain in Mesopotamia in the First Great War was to be commemorated in *These Men, Thy Friends*, 1927. He lectured in Bengali at Oxford, where later he held research fellowships in Indian history at Oriel College. He died at Bledlow, Bucks, April 28, 1946. Poet, historian, novelist, and essayist, Thompson made notable translations of Tagore and wrote studies of his work; edited the series of brochures, *Augustan Poets*; issued his own collected poems in 1930. He published a *History of India*, 1927; *Rise and Fulfilment of British Rule in India* (with G. T. Garratt), 1934; *The Making of Indian Princes*, 1943; and in fiction is best known by *An Indian Day*, 1927; *Burmese Silver*, 1937.

Thompson, Sir Edward Maunde (1840-1929). British scholar. Born in Jamaica, May 4, 1840, he was educated at Rugby and University College, Oxford. In 1861 he became an assistant in the British Museum, and in 1878 was made keeper of manuscripts.



Sir E. M. Thompson,
British scholar

From 1888 he was chief librarian, and he retired in 1909, being made G.C.B. An authority on palaeography, Thompson wrote *An Introduction to Greek and Latin Palaeography*, 1912, and edited the writings of certain English chroniclers. During 1895-96 and 1905-06 he was reader in bibliography at Cambridge. He died Sept. 14, 1929.

Thompson, Francis (1859-1907). British poet. Born at Pres-



E. J. Thompson,
British writer

ton to R.C. parents, Dec. 18, 1859, he was educated at Ushaw College for the priesthood, but, abandoning this idea, he studied medicine at Owens College. Failing to qualify, he settled in London and fell into straits, his miseries being accentuated by the opium habit; he worked as a cobbler's assistant. He sent two poems on scraps of paper to Merrie England, whose editor, Wilfred Meynell, set to work with his wife Alice to rehabilitate Thompson. Further pieces won the praise of Patmore, and a first book of poems was issued in 1893, to be followed by *Sister Songs*, 1895, and *New Poems*, 1897. Thompson also contributed literary criticism to *The Academy* and *The Athenaeum*. He died of consumption, Nov. 13, 1907. Thompson uses a jewelled vocabulary and beautiful images, and sometimes strikes a note of mystical rapture forgotten since the 17th century. The *Hound of Heaven* has proved an inspiring poem; In *No Strange Land* is sung as a hymn; *The Heart* is a magnificent sonnet; yet this good Lancastrian could also write a little piece about cricket, *At Lord's*. A collected ed. of his poems appeared in 1946. There are *Lives* by E. Meynell, 1916; R. L. Méroz, 1927.



Francis Thompson,
British poet

Thompson, Sir Henry (1820–1904). British surgeon, born at Framlingham, Aug. 6, 1820. He was at first in business, but coming to London, was apprenticed to a doctor at Croydon, and in 1844 entered University College. In 1850 he was house surgeon, and next year started as a G.P. Made F.R.C.S. in 1853, he became professor of surgery at University College Hospital in 1866, and Hunterian professor at the College of Surgeons in 1883. He specialised in surgery of the urinary organs, on the diseases of which he wrote in 1868 a standard work.



Sir Henry Thompson,
British surgeon

Thompson was an astronomer, and built an observatory at Molesey. He exhibited paintings at the Royal Academy; he wrote novels and magazine articles. He was an

authority on diet, and one of the earliest advocates of cremation. His dinners for eight persons, with eight courses, at 8 o'clock, called octaves, were famous, and the 300th was attended by the prince of Wales, later George V. Thompson, knighted in 1869, made a baronet in 1899, died April 18, 1904.

Thompson, Sir (Henry Francis) Herbert (1859–1944). British Egyptologist, born April 2, 1859. He was educated at Marlborough and Trinity College, Cambridge; then abandoned the law for Egyptology, specialising in its Coptic and demotic branches, of which he became a leading authority. His publications included *Coptic Inscriptions* (in Quibell's *Excavations at Saqqarah*), 1907; *A Family Archive from Siut*, 1934. He edited the earliest extant copy of S. John's gospel from a Coptic papyrus, and made out a list of demotic papyri in the British Museum. He succeeded his father as 2nd baronet in 1904, and died at Bath, May 26, 1944.

Thompson, Lydia (1836–1908). British actress, born in London, Feb. 19, 1836. She went on the



Lydia Thompson,
British actress

stage as a dancer at Her Majesty's Theatre in 1852, and next year scored a success in the Haymarket pantomime, *Little Silverhair*. After a Continental tour, she took a company to America in 1868, touring with great success. In 1874 she returned to the London stage in Farnie's burlesque, *Bluebeard*. Other visits to America followed, and she finally settled in London in 1891, retiring from the stage in 1904. She died Nov. 17, 1908.

Thompson, Reginald Campbell (1876–1941). British archaeologist. Born Aug. 21, 1876, he went to St. Paul's school and Caius College, Cambridge. Assistant to Budge at the British Museum, 1899–1905, he made his earliest excavation at Nineveh in 1904 and his most important during 1928–31. An authority on Arab-speaking peoples and lost civilizations of the Middle East, he was *Shillito* reader in Assyriology at Oxford. His works included *Reports of Magicians and Astrologers of Nineveh and Babylon*, 1900; *Semitic Magic*, 1908; *Antiquities of Mesopotamia*, 1918; *The Assyrian Herbal*, 1924. He died April 25, 1941.

Thompson, Silvanus Phillips (1851–1916). British scientist. Born at York, June 19, 1851, he was educated at Boothams school, Pontefract institute, and the Royal School of Mines. He was professor of experimental physics at University College, Bristol, 1876–85, then principal and professor of physics in the City and Guilds technical college until his death on June 12, 1916. Thompson was a leading physicist of his time, best known for his work on electricity. He published in 1844 *Dynamo-electric Machinery*, a standard work for many years, as was *Elementary Lessons in Electricity and Magnetism*. His *Life of Lord Kelvin*, 1910, is a masterly account.



Silvanus Thompson,
British scientist

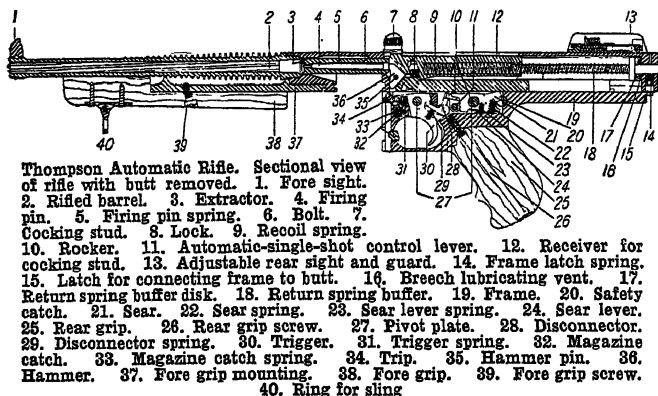
Thompson, William. Real name of the English prizefighter who always appeared under the name of Bendigo (*q.v.*).

Thompson, William Hale (1869–1944). American politician, commonly called Big Bill Thompson. Son of a real estate dealer, he entered politics in Chicago. He was elected mayor in 1915 and 1919, but his administration was so corrupt that he was defeated in 1923. In 1927 he once more became mayor with the slogan *America First*, his policy being to "make the king of England keep his snoot out of America." Thompson dismissed Chicago's superintendent of schools on the ground that he allowed text-books containing pro-British propaganda. In 1931 the citizens sent Thompson back into private life. He died March 19, 1944.

Thompson Automatic Rifle. Light automatic or sub-machine-gun popularly called Tommy gun. Invented in 1921 by John T. Thompson, a Chicago police officer, it was specially designed for the use of police against gangsters. The gun can fire single or automatic shots of .45 calibre. It is operated by recoil, the spent cartridge striking the bolt face, automatically recocking the weapon, and bringing a new round into the breech. The magazine may be of the box or drum type; the former holds 20 rounds. The drum magazine, with 50 rounds, is placed in the vertical plane below the barrel and at right angles to the axis of the gun. It rotates with each shot to bring

the following round in line with the extractor.

The gun weighs 11 lb. 6 oz., the barrel is 12½ ins. long. Rifling is grooved with a twist of 1 in 16.



Maximum rate of fire is 1,500 r.p.m., and effective range 750 yds. Firing is practicable from hip or shoulder.

Large numbers of Tommy guns were used by British forces in the Second Great War, until they were displaced by the simpler and less costly Sten carbine (*q.v.*).

Thoms, WILLIAM JOHN (1803-85). British antiquary. A Londoner, born Nov. 16, 1803, he was



William J. Thoms, British antiquary

for 20 years in the secretary's office at Chelsea Hospital; clerk, 1845-63, then deputy librarian until 1882, of the house of lords; F.S.A., 1838, and secretary, 1838-73, of the Camden Society. He started and edited *Notes and Queries*, 1849-72. His publications include *Early Prose Romances*, 1827-28; *Lays and Legends*, 1834; *The Book of the Court*, 1838; *Stow's Survey of London*, 1842; *Reynard the Fox*, 1844; *The Longevity of Man*, 1873. He died Aug. 15, 1885.

Thomsen, VILHELM LUDVIG PEDER (1842-1927). Danish philologist. He was born, Jan. 25, 1842, at Copenhagen, where he became professor of comparative philology in 1887. He travelled extensively, and successfully deciphered the old Turkish inscriptions of Siberia and Mongolia. Thomsen's *Relations between Ancient Russia and Scandinavia* and *The Origin of the Russian State*, consist of lectures delivered in Oxford. He died May 14, 1927.

Thomson, CHRISTOPHER BIRDWOOD THOMSON, BARON (1875-1930). British soldier and politician. Born April 13, 1875, he joined the R.E. in 1894 and served

in the Mashonaland and S. African campaigns. He was on the War office staff, 1911-14, then went to France; in 1915 became military attaché to Rumania, in which capacity he influenced that country to enter the war; and later served in Palestine. At Versailles he was military representative on the supreme war council. Military adviser to the Labour party commission which visited Ireland in 1920, he was secretary for air in MacDonald's first government, having been raised to the peerage in 1923. Given the same post in the govt. of 1929, he was killed when the airship R101 crashed near Beauvais, Oct. 5, 1930. A memoir by Princess Marthe Bibesco appeared in 1932.

Thomson, SIR BASIL HOME (1861-1939). British administrator. Son of William Thomson,



Sir Basil Thomson, British administrator

archbishop of York, he was born April 21, 1861, educated at Eton and New College, Oxford, and was called to the bar. Joining the colonial service, he served in Fiji, Tonga, and British New Guinea, acting as prime minister of Tonga. His *Divisions of a Prime Minister*, 1894, refers to this episode. Entering the prison service in 1896, he became governor of Dartmoor and Wormwood Scrubs prisons in succession; secretary to the prison commission, 1908; assistant commissioner of metropolitan police,

and director of the C.I.D., 1913; and as a knight, chief of the intelligence dept. from 1919 to 1921, when he retired. He died March 26, 1939. Among Sir Basil's books of reminiscences are *Queer People*, 1922; *The Criminal*, 1925; *The Story of Scotland Yard*, 1935. In early life he wrote nautical tales and Grand Guignol pieces.

Thomson, SIR GEORGE PAGET (b. 1892). British physicist, son of Sir J. J. Thomson (*q.v.*). He was educated at the Perse school and Trinity College, Cambridge; appointed lecturer at Corpus Christi, he left for army service in the First Great War. In 1915 he transferred to the R.F.C. and worked on aeronautical research, returning to Cambridge in 1919. During 1922-30 he was professor of natural philosophy at Aberdeen, then took the chair of physics at the Imperial College of Science, where he carried out research work on electron diffraction and nuclear physics. In 1937 he was awarded, jointly with C. J. Davisson, the Nobel prize for physics, in recognition of his discovery of interference phenomena in the irradiation of crystals by electrons. Thomson, who was chairman of the first British committee on atomic energy in 1940, received a knighthood in 1943. During 1946-47 he was scientific adviser to the British delegate of the United Nations atomic energy commission.

Thomson, HUGH (1860-1920). British artist. Born June 1, 1860, in N. Ireland, he went to London about 1885, and at once found work on *The English Illustrated Magazine*. Specialising in the 18th and 19th centuries, he illustrated *The Vicar of Wakefield*, *Cranford*, *Quality Street*, and the works of Jane Austen, Thackeray, and Austin Dobson. He also did distinctive topographical drawings in black-and-white series. He died May 7, 1920.

Thomson, JAMES (1700-48). British poet. Born at Ednam, Roxburghshire, Sept. 11, 1700, son of the minister of the parish, he entered Edinburgh university with a view to entering the ministry. Divinity was not to his taste, and in 1725 he settled in London. In 1726 appeared his famous poem in blank verse, with the title of



Hugh Thomson, British artist

Winter. It was followed by companion poems, Summer, Spring, Autumn; the quartette being published as *The Seasons* in 1730. From 1734 he gave instalments of his poem *Liberty*, a complete failure. Several dramatic efforts such as *Sophonisba*, 1729, and *Agamemnon*, 1738, were equally unsuccessful; *The Masque of Alfred*, 1740, written in collaboration with David Mallet (c. 1705-65), is notable only as containing *Rule, Britannia (q.v.)*. Thomson's other poem of value is the allegorical *Castle of Indolence*, 1748. He was the first of his time to make nature the central theme of a poem. He died Aug. 27, 1748, at Richmond.

Thomson, James (1834-82). British poet. He was born at Port Glasgow, Nov. 23, 1834, and educated at the Royal Caledonian Asylum. After some years as an army schoolmaster, he was befriended by Charles Bradlaugh and wrote for *The National Reformer*, in which journal appeared, in 1874, *The City of Dreadful Night*, the gloomy but impressive narrative poem upon which Thomson's fame chiefly rests. A pessimist by temperament, Thomson lived a lonely life, the wretchedness of which was aggravated by his habit of intemperance. He died June 3, 1882. His other works include *Vane's Story*, which has been styled an autobiographical phantasy; a few striking lyrics, and some prose essays and criticisms. Thomson's pseudonym, *Bysshe Vanolis*, was made up from the second name of Shelley, whom he admired profoundly, and an anagram of Novalis. *Consult Poetical Studies*, 1896; *Life*, H. S. Salt, 1905.

Thomson, John (1778-1840). Scottish painter. Born at Dailly, Ayrshire, Sept. 1, 1778, he was educated for the Church at Glasgow and Edinburgh universities, studying painting, meanwhile, under Alexander Nasmyth. Ordained in 1800, he succeeded his father at

Dailly, and in 1805 he became minister of Duddingston. He died Oct. 28, 1840. Thomson exhibited romantic landscapes in the Scottish exhibitions from 1808 onwards.

Thomson, Sir John Arthur (1861-1933). British scientist. He was born in East Lothian, July 8, 1861, and, after graduating at Edinburgh university, studied at Jena and Berlin. Though originally an arts student, he turned to biology and zoology, and became lecturer in those subjects at the Edinburgh school of medicine. In collaboration with Sir Patrick Geddes he wrote *The Evolution of Sex*, 1899, a book which soon became widely known. In the same year he was appointed professor of natural history in Aberdeen university, a post he held until 1930. A popular lecturer and a clear interpreter of scientific principles in his chosen subjects, Thomson, while he did little original research, acquired a large public with such books as *The Wonder of Life*, 1914; *Secrets of Animal Life*, 1919; *Science, Old and New*, 1924; *Science and Religion*, 1925; *The Outline of Natural History*, 1932. In his later years he attempted to reconcile science and religion. Knighted in 1930, he died Feb. 12, 1933. D. L. Thomson (b. 1901), professor of biochemistry at McGill university, was his son. Another son was A. L. Thomson (b. 1890), second secretary of the medical research council.

Thomson, Sir Joseph John (1856-1940). British physicist. He was born near Manchester, Dec. 18, 1856, and educated at Owens College, Manchester, and Trinity College, Cambridge. In 1883 he became lecturer in mathematics at Trinity, and the following year, when only 27 years of age, became Cavendish professor of experimental physics. He carried out important work on electromagnetic theory, extending the work of Clerk-Maxwell, who had been an earlier Cavendish professor. Thomson was, however, soon concerned with the branch of physics which was to become peculiarly his own—the phenomena connected with the discharge of electricity through gases. Following the discoveries of Röntgen, Crookes, and others, he showed that the so-called cathode rays produced by electric discharges in

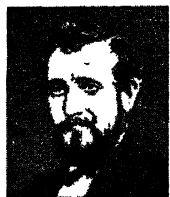
rarefied gases were made up of minute electrified particles. The discovery of these electrons was first made known by Thomson in a R.I. lecture in 1897. This revolutionary discovery led to many extensions of physical knowledge, and was the chief reason for many of his honours, the Nobel prize for physics, 1906, a knighthood, 1908, and the O.M., 1912. P.R.S., 1915-20, he became master of Trinity in 1918, holding this position until his death. Although pressure of other work compelled him to resign his Cavendish professorship in favour of Rutherford, he continued to work in the Cavendish lab. and was appointed hon. professor there. Besides many scientific publications he wrote an entertaining autobiography, *Recollections and Reflections*, 1936. Thomson died Aug. 30, 1940. *A Life*, by Lord Rayleigh, appeared in 1942.

Thomson, William (1819-90). British prelate. Born at Whitehaven, Feb. 11, 1819, and educated at Shrewsbury and Queen's College, Oxford, he was ordained in 1842, and after holding several curacies returned to Oxford in 1847 as tutor of his old college, becoming provost in 1855. There he was a leading advocate of university reform. In 1861 he was consecrated bishop of Gloucester, and the next year became archbishop of York. He greatly strengthened the position of the Church in the N. of England. He found time also for theological writings, controversies, and ecclesiastical legislation. He died at Bishopthorpe, Dec. 25, 1890.

Thomson Effect. Physical phenomenon, discovered by William Thomson, later Lord Kelvin. During experiments on the relationship between heat and current in heated metal wires, Kelvin concluded that there must be reversible thermal effects other than the Peltier effect. He found that, when a current flows along a wire which varies in temp. from point to point, at any given point on the wire heat is liberated, if the current flows in one direction, and absorbed, if it flows in the opposite direction. This phenomenon, called the Thomson effect after him, is of great importance in pyrometry, as it affects the be-



James Thomson,
British poet



James Thomson,
British poet



William Thomson,
British prelate



Sir J. J. Thomson,
British physicist

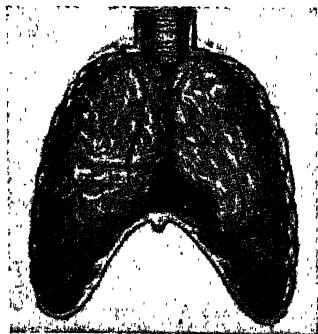
haviour of thermocouples. See Peltier Effect; Pyrometer; Thermocouple.

Thomsonite. Member of the zeolite group of minerals. It is a complex hydrous silicate of calcium, sodium, and aluminium, occurring in snow-white columnar or radiating groups of crystals, in cavities and cracks in basalts, etc., and in certain classes of mineral veins. See Zeolite.

Thor. Norse god of thunder, son of Odin (the heavens) and Jord (the earth), husband of Sif (the cornfield); the friend of man and foe of giants. His red beard flaming, he drove to battle in a goat-drawn car. There are humorous stories of his dealings with the giants. His home is Bilskirnir, containing 540 halls. Thursday was originally Thor's day. See Mythology: Norse.

Thoracic Duct. In anatomy, the principal vessel of the lymphatic system. It receives the lymph from the smaller lymphatic vessels of the lower limbs, abdomen, left upper limb, and left side of the thorax, head, and neck. Passing upwards in front of the spinal column from the level of the second lumbar vertebra, it terminates by opening into the angle of union of the left internal jugular and left subclavian veins. The length of the thoracic duct is from 15 to 18 ins.

Thorax (Gr., breastplate). Anatomical name for the chest (*q.v.*). The thorax in man is conical in



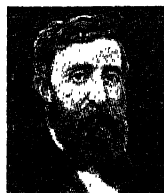
Thorax. Sectional diagram of the human chest, showing position of the lungs and heart

shape, the front being formed by the breast-bone and cartilages of the ribs, and the sides and back by the ribs, the back being completed by the dorsal vertebrae of the spine.

In insects, the thorax, joined closely to the head and loosely to the abdomen, bears the legs and wings.

Thoreau, HENRY DAVID (1817-62). American author and naturalist. Born at Concord, Mass.,

July 12, 1817, the son of a manufacturer, he was educated at Harvard. He worked for a time as a teacher and a surveyor, but his tastes were those of a naturalist and a recluse. Deciding to live a



H. D. Thoreau, American author

contemplative life alone, in 1845 he took up his abode in a hut on the shores of Walden Pond; providing for his wants by casual labour, he found he could earn enough by six weeks' work yearly to pass the remaining 46 in ease, and stayed in the woods until nearly the end of 1847. He became remarkably intimate with animal and bird life, and then described his experiences in the celebrated *Walden, or Life in the Woods*, 1854. Thoreau had by then made his home with his friend Emerson, and died of tuberculosis at Concord, May 6, 1862. A dogmatic idealist, he also wrote *Excursions*, 1863; *The Maine Woods*, 1864; *Letters and Poems*, 1865. Among many lives, that by W. E. Channing, 1873, still holds the field.

Thorez, MAURICE (b. 1900). French politician. Son of a coal miner, he was born at Noyelles Godault, Pas-de-Calais, April 28, 1900, and left school at 12 to work in the mines. He moved over from the Socialist to the Communist party in 1920. Representing Ivry as Communist deputy, he led his party in the chamber during 1936-39. At the outbreak of the Second Great War he went into hiding to avoid military service, was deprived of his nationality, and condemned in absence by a military tribunal. Having spent some time in Moscow, he returned to France in 1944, became a member of the consultative assembly, and being pardoned in 1945 was minister of state under Gen. de Gaulle. Thorez was a member of successive cabinets until 1947 when, the Communists having voted against the govt. of which they were members, President Auriol decreed their removal from office.

Thoria. Thorium dioxide, ThO_2 . It is an amorphous white powder made from monazite sands. It has application as a medium for X-ray of the internal organs, but there is danger of injurious effects from radio-activity. See Thorium.

Thorianite. In mineralogy, name given to a rare mineral containing thorium, uranium, cerium,

and other rare earths. It occurs in Madagascar and Ceylon, associated with zircon, orthite, etc.

Thorild, THOMAS (1759-1808). Swedish author. Originally named Thoren, he was born at Kongelf. He was the first to break away from the artificiality of the French school of poetry, and his earliest poem, *The Passions*, 1772, started a famous literary controversy, which led up to his *Criticism of Critics*, 1791. In 1792, in a preface addressed to the regent, he expressed views which were considered so dangerous that he was sentenced to four years' banishment. He died Oct. 1, 1808.

Thorite. In mineralogy, a thorium silicate. Orange-yellow to dark brown in colour, with a glassy lustre, it is also frequently called uranthorite from the quantity of uranium oxide often associated with it. The mineral is chiefly found in Norway.

Thorium. Radio-active element, symbol Th; at. no. 90; at. wt., 232.12; density, 11.3 gm per c.c.; melting point, 1,680° to 1,730° C. It has a cubic close-packed crystal structure, emits α -rays (half-life 1.39×10^{10} yr.), and gives its name to the third series of natural radio-active elements. It was first found in a mineral now known as thorite by Berzelius in 1828. Thorite (ThSiO_4) is said to occur only in Norway; but thorianite, another rare mineral, is known in Madagascar and Ceylon. The main source of thorium is monazite sand, which is essentially a phosphate of the cerium earths containing associated thorium and occluded helium. Extensive deposits are found in Travancore and Brazil.

Thorium combines readily with hydrogen, nitrogen, oxygen, carbon, and alloys with other metals. This makes the preparation of the pure metal difficult, but good results follow reduction of anhydrous thorium chloride with sodium in a sealed tube. As thus prepared thorium is a dark grey powder, but in the massive form is white and soft. Of the salts, only the nitrate is of any commercial importance, being used in incandescent gas mantles. The fabric of the mantle is dipped in a solution of cerium and thorium nitrates mixed in such proportions that, after burning off the thoria and ceria will be present to the extent of 99 and 1 p.c. respectively. Metallic thorium shows promise for coating tungsten filaments in photo-electric cells, in glow tube electrodes, and also as X-ray targets.

Thorn. General term applied to shrubs or trees whose branches are armed with spines, or have some of their shoots hardened into thorns. Examples are hawthorn (*Crataegus oxyacantha*) and gorse (*Ulex europaea*). The thorns of the former are modified shoots, whereas in gorse they are formed from the leaves. In desert plants thorn-formation is associated with lack of water.

Thorn. This town of N.E. Europe is entered under its Polish name, Toruń.

Thornaby-on-Tees. Mun. bor. of the N. Riding of Yorkshire, England. It is situated on the Tees, opposite Stockton, a bridge connecting the two places. It is served by rly., and has sugar and flour mills, iron foundries, and engineering works. Thornaby was incorporated in 1892. Pop. 21,233.



Thornaby-on-Tees arms

Thorn Apple (*Datura stramonium*). Annual herb of the family Solanaceae. It is probably a native



Thorn Apple. Faded leaves and prickly capsules of the plant

of Asia, but this is not certainly known, as the plant occurs in a semi-wild condition throughout the world. It is a rank weed with ovate leaves, whose margins are variously wavy and toothed. The large white flowers are funnel-shaped, and are succeeded by large four-valved, prickly capsules. It is narcotic-poisonous, and the dried leaves are smoked for the relief of asthma.

Thorndike, DAME SYBIL (b. 1882). British actress. Daughter of a clergyman, she was born at Gainsborough, Oct. 24, 1882, and after studying as a pianist at the Guildhall school, joined Ben Greet's Shakespeare co., first acting professionally at Cambridge in *The Merry Wives of Windsor*, 1904. An American

tour was followed by a spell with Miss Horniman's co. in Manchester, and her London début

was at the Scala Theatre in *The Marquis*, 1908. She scored successes in *Hindle Wakes*, and *Jane Clegg*; played Shakespearean leads at the Old Vic during 1914-18; made an impression in Greek tragedy and *Grand Guignol* (q.v.); and became internationally famous by creating the part of S. Joan, 1924, in Bernard Shaw's play. Dignity, strength, and emotional range were revealed in the classical rôles of Hecuba, Medea, Lady Macbeth, Lady Teazle; in the modern drama *Lottie Dundass*, 1943; as Aase in *Peer Gynt*, 1944; in *The Linden Tree*, 1947. She achieved an unexpected success in the satirical *Advertising April*, 1923, and gave a brilliant performance as Edith Cavell in the silent picture *Dawn*. Sybil Thorndike married (Sir) Lewis Casson (q.v.) in 1908, and was created D.B.E. 1931. An outspoken left-winger, she often appeared at political meetings.

Her brother, Arthur Russell Thorndike (b. Feb. 6, 1885), was an accomplished actor and thriller writer, especially known for the Dr. Syn series. He published a biography of his sister, 1929.

Thorne. Market town of the W. Riding of Yorks, England. Standing on the river Don, it is 10 m. N.E. of Doncaster by rly. An agricultural centre, it also engages in barge building and rope making. The church, dedicated to S. Nicholas, dates from the time of Edward III. Pop. 14,606.

Thorne, GUY. Pen-name of Cyril Arthur Edward Ranger Gull (1876-1923), British novelist and journalist. His fame rests almost entirely on his novel *When It Was Dark*, which made a popular sensation in 1903 by the unconventionality of its theme, namely a conspiracy to render Christianity invalid by the pretended discovery of the remains of the body of Our Lord.

Thorne, NORMAN (1901-25). English murderer. Son of an engineer in a govt. dockyard, he started a chicken farm at Crowborough, Sussex, in 1922. He was involved in a love-affair with a neurotic girl, Elsie Cameron,



Sybil Thorndike, British actress

when he met another woman, whom he wished to marry. Elsie Cameron visited the farm on Dec. 5, 1924, and was never again seen alive. Thorne stated that she had not arrived, but she had been recognized by a neighbour. Police digging on the farm found first Elsie Cameron's attaché case and later her body, in three parts, buried there. Thorne's defence was that she had committed suicide by hanging, but the post-mortem examination revealed numerous bruises on her head, arms, and legs. Thorne was tried at Lewes assizes in March, 1925, and hanged on April 22.

Thorne, WILLIAM JAMES (1857-1946). A British Labour leader and politician. Born Oct. 8, 1857, the son of a Birmingham labourer, Will Thorne began at the age of six working 12 hrs. a day for a rope spinner at 2s. 6d. a week, then at week-ends for an uncle who was a barber, earning a further shilling. He had no schooling. A walk to London at 24 was the turning point in his career, for he joined the newly formed Social Democratic federation. Street corners made him an effective if rough orator. In 1889, with Ben Tillett (q.v.), he formed the organization which grew into the national union of general and municipal workers, and was its secretary for 45 years. He was president of the T.U.C. in 1912. On West Ham borough council from 1890, and its mayor in 1917-18, he was Labour M.P. for that borough (Plaistow div.), 1906-45, the freedom being conferred on him in 1930. The oldest M.P., he was made P.C. in the dissolution honours, 1945. He died Jan. 2, 1946. An autobiography, *My Life's Battles*, appeared 1925.



W. J. Thorne, British politician

Thornea Island or **THORNEY ISLAND.** Former islet in the Thames marshes. About 40 acres in extent, it comprised the precinct of the abbey and palace of Westminster (q.v.).

Thornhill, SIR JAMES (1675-1734). British painter. Born at Melcombe Regis, he studied under Highmore, whom he was to succeed in 1720 as serjeant-painter to the king. He was employed by Queen Anne to paint the cupola of S. Paul's cathedral, which he decorated with eight scenes from

the apostle's career. Thornhill had to paint while lying in a cradle, and nearly lost his life when stepping back along a plank to examine his work; an assistant threw some paint on it, causing the artist to spring forward. He carried out decoration of the painted hall at Greenwich Hospital during 1707-27, and left paintings at Hampton Court, Moor Park, and Blenheim, and altar-pieces at All Souls' and Queen's Colleges, Oxford. Hogarth, who married his daughter, was among Thornhill's pupils. Knighted 1715, and M.P. for Melcombe from 1722, he died May 13, 1734.

Thornhill, DAME RACHEL. British social worker, better known by her maiden name, Crowdy (*q.v.*).

Thornliebank. District of Glasgow, Scotland. It is 4 m. S. of the city proper, with a station on the rly. It owes its existence to the establishment of the cotton industry about 1770, and textile manufacture still provides the chief occupation. Pop. 2,289.

Thornton. Name of several places in Great Britain. One is a village, 4 m. W. of Bradford, Yorks; here the three Brontë sisters were born (*see* Brontë). Another is an urban dist., 5 m. N.E. of Blackpool, Lancs. Thornton, Fife, is a rly. junction, 5 m. N. of Kirkcaldy. Thornton-in-Craven is an industrial village of Yorks (W.R.), 6 m. S.W. of Skipton. Thornton-le-dale, near Pickering, is regarded as one of the prettiest villages in the same county. In Lindsey div. of Lincs is Thornton Abbey, with ruins of a religious house founded in 1139.

Thornton. Name of a family of English bankers. John Thornton (1720-90) was a prominent evangelical, a supporter of philanthropic causes, and a friend of Cowper and John Newton. John's two sons, Samuel and Henry, shared their father's religious views, being members of the Clapham Sect. Samuel (1755-1838) was M.P. for Hull, 1784-1806, and afterwards for W. Surrey, and a director of the Bank of England, 1780-1833. Henry (1760-1815) joined the banking firm of Downe, Free, and Thornton, and was M.P. for Southwark, 1782-1815. Later members of the family include Percy Melville Thornton (1841-1918), who was M.P. for Clapham, 1892-1910, a barrister, athlete, and writer; and Charles Inglis Thornton (1850-1929), noted as one of the greatest hitters known to cricket.

Thornton Heath. District of Croydon, Surrey, England. It lies to the N. of Croydon, adjacent to Norbury, and is served by train from Croydon, and by bus and electric rly. from London, with a rly. station on the main Brighton line from Victoria. Purley Way, the Croydon by-pass, diverges from the main road at Thornton Heath pond.

Thornycroft, SIR JOHN ISAAC (1843-1928). British naval architect. Born in Rome, Feb. 1, 1843,



Sir John Thornycroft, British naval architect

and educated at Glasgow university, he founded a shipbuilding works at Chiswick in 1866, and obtained a reputation for torpedo-boat construction. He introduced the turbine propeller, water-tube boilers, etc., and was knighted in 1902. The works were moved in 1906 to Southampton. Thornycroft died at Bembridge, June 28, 1928.

Thornycroft, THOMAS (1815-85). British sculptor. Born in Cheshire, he was educated at Congleton and studied in Italy. His work as a sculptor was diverted by his interest in mechanical projects, but several statues became familiar landmarks in Victorian London, *e.g.* that of Charles I in Westminster Hall, also the group of Commerce on the Albert Memorial, and Boadicea and her daughters at Westminster Bridge. His English Poets fountain (statues of Chaucer, Shakespeare, and Milton), in which he was assisted by his son Hamo (*v.i.*), erected at the junction of Park Lane and Hamilton Place in 1875, was removed in 1948. Other works were equestrian statues of the prince consort at Liverpool and Wolverhampton. Thornycroft died Aug. 30, 1885.

Thornycroft, SIR WILLIAM HAMO (1850-1925). British sculptor. Born in London, March 9, 1850, he was educated at Macclesfield and University College School. He assisted his father (*v.s.*) in the English Poets fountain in Park Lane; gained the R.A. gold medal in 1875; was elec-



Sir Hamo Thornycroft, British sculptor

ted A.R.A. in 1884, and R.A. in 1888. His Teucer was bought for the Chantrey collection in 1881. The Gordon statue which stood in Trafalgar Square until 1948 is a well-known example of his classic style. Knighted in 1917, he died Dec. 18, 1925. *See* Alfred; Cromwell.

Thorold. Town of Ontario, Canada. It is situated on the Welland ship canal, 9 m. N.W. of Niagara Falls, to which it is connected by electric rly. It is also served by the C.N.R. There are pulp, board, and paper mills, machine shops, and sawmills. Pop. 5,305.

Thorough. Name given in English history to the policy carried out principally by Strafford, with the cooperation of Laud in the interests of Charles I in England, Scotland, and especially Ireland. *See* Ireland; Strafford.

Thorough Bass. Bass which throughout a piece of music has the harmonies indicated by figures according to the intervals above it. An absence of a figure implied a common chord, 6 a first inversion, 4 a second inversion, and so on with other chords. It was invented probably in the 16th century, and composers of the new monodic school found it a convenient kind of shorthand. Accompaniments, instead of being written out, were left to the skill and taste of the accompanist.

Thoroughbred. Name given to a graceful breed of horses of mainly Eastern descent. With long, slender head and legs and short back, they all trace their ancestry to one of three sires, the Darley Arabian, imported in 1706; the Godolphin Barb, foaled in 1724; and the Byerly Turk, which carried its owner, Capt. Byerly, at the battle of the Boyne. The descendants of these three have had their pedigrees inscribed for 150 years in the general stud book. All the racehorses of the world have been derived from British stock. *See* Stud Farm.

Thorpe Bay. Part of the co. bor. of Southend-on-Sea, Essex, England. It lies at the mouth of the Thames estuary, about 2½ m. E. of Southend, and 1½ m. S.W. of Shoeburyness, and has a rly. station.

Thorpe, SIR THOMAS EDWARD (1845-1925). British chemist. Born near Manchester, Dec. 8, 1845, and educated at Owens College and Heidelberg and Bonn universities, he was appointed professor of chemistry in the Andersonian Institution, Glasgow, 1870; to the chair of chemistry

at Yorkshire College, Leeds, 1874; and at the Royal College (then Normal School) of Science, London, 1885. He was later emeritus professor of general chemistry in the Imperial College of Science and Technology. Knighted in 1909, Sir Edward died Feb. 23, 1925. His chief research



Sir Edward Thorpe,
British chemist

was done on the paraffin hydrocarbons and the derivatives of fluorine and phosphorus; and his publications included Dictionary of Applied Chemistry, 3 vols., new ed. 1921; History of Chemistry, 2 vols., 1909-10; Alcoholic Tables, 1915.

Thorshavn. Capital of Faroe Islands, belonging to Denmark. Centre of the fishing industry, it lies on the E. side of Stromo, the largest island, on a well protected sound. During the Second Great War a R.A.F. flying-boat base was established here. Pop. est. 2,000.

Thorvaldsen, BERTEL (1770-1844). Danish sculptor. Born at Copenhagen, Nov. 19, 1770,



B. Thorvaldsen,
Danish sculptor

son of a carver of figures for ships' prows, he studied art from boyhood at Copenhagen academy. In 1793 he won a gold medal and a scholarship enabling him to pass three years abroad. From 1796 he was in Rome, where in 1809 he produced a Jason which won him fame. He was in Italy until 1819, and again, after a three-year visit to Denmark, until 1838. He died at Copenhagen, March 24, 1844.

Thorvaldsen was happiest in mythological statuary, wherein he reproduced with wonderful success the style and spirit of ancient Greek sculpture. The medallion reliefs Night and Morning are among his best-known works in this vein. Colossal sculptures of Christ and the apostles in Copenhagen cathedral are the most famous of his religious efforts. He also designed the Lion of Lucerne (*q.v.*).

Thoth. Egyptian deity. The name means measurer. As the divine scribe, Thoth recorded the result of the weighing of souls in

the underworld. Identified with the Greek Hermes, he was worshipped at Hermopolis, in the Delta, and Hermopolis Magna (Eshmunein), where there are ibis graves. He is represented as being ibis-headed, with the lunar disk and crescent; the cynocephalus baboon also became sacred to him. See Amenti; Egypt.

Thothmes or **THUTMES.** Name of four kings of Egypt of the XVIIIth dynasty. Thothmes I, son-in-law and successor of Amenhotep I, reigned for 25 years from about 1539 B.C. The first great Egyptian military commander, he invaded Nubia with river craft, fought a battle in midstream, and extended the Theban power to the 4th cataract. His Syrian campaigns carried Egyptian arms to the Euphrates, and resulted in immense booty, devoted to the embellishment of the Amen temple at Karnak (*q.v.*). His mummy and gilded coffin were preserved at Cairo.

Thothmes II was the son and successor of Thothmes I. He appears to have begun reigning in 1501 with his half-sister Hatshepsut as consort and co-regent. His mummy, at Cairo, shows him to have been about 30 years old at death, and 5 ft. 11 ins. in height.



Thothmes II. From
his mummy in the
Cairo museum

Thothmes III is usually regarded as the son of Thothmes II by Aset; or as son of Thothmes I. He also apparently became coregent with Hatshepsut, and after her death in 1479 he reigned alone for 32 years. So much did he resent her treatment that he defaced her monuments, thus confusing the chronology. He undertook 17 foreign campaigns, marked by victories at Megiddo, Kadesh, and Carchemish, and established his power from Armenia to the



Thothmes III,
King of Egypt

Sudan. This mighty conqueror, administrator, and builder left his annals inscribed upon temple walls at Karnak. Modern scholarship tends to identify him, and not Rameses II,

with the Pharaoh of the Oppression. His mummy, at Cairo, shows him as a squat, thick-set man. (See Cleopatra's Needles; Papyri.)

Thothmes IV was the son and successor of Amenhotep II. He reigned for nine years about 1420 B.C. He undertook military expeditions to Nubia and Phoenicia, and maintained friendly relations with Babylon and Mitanni, taking from the Mitannian court his consort Mutemua—the first foreign alliance made by an Egyptian monarch. He carried out the removal of the sand-drift under which the great Sphinx at Gizeh lay buried. His tomb, opened by Davis and Carter in 1903, yielded his state chariot, adorned with fresco scenes recording his exploits.

Thou, JACQUES AUGUSTE DE (1553-1617). French lawyer and historian. Born in Paris, Oct. 8,



Jacques de Thou,
French lawyer

1553, he studied law there and at Valence, travelled in Italy, and in 1576 became councillor-clerk to the parlement of Paris. A trusted friend of Henry III, he carried on diplomatic negotiations in Navarre, 1581, and became councillor of state, 1588. He helped to draft the edict of Nantes, 1598, and later was one of the three finance controllers appointed by Marie de' Medici. His history of his own times, published 1604-08, was placed on the Index in 1609. He died May 7, 1617.

Thouars. Town of France. In the dept. of Deux Sèvres, it stands on the Thouet river, 52 m. from Tours. The river almost encircles the town. The chief building is the castle, the present building, which stands above the town, dating from the 17th century. S. Médard and S. Laon are two interesting churches. The buildings of the abbey of S. Laon were later used as the hôtel de ville. Thouars was the seat of the great family of La Trémoille, who built the castle and the fortifications, of which there are some remains. There are some manufactures and a trade in wine and agricultural produce. Pop. 10,422.

Thourout. Town of Belgium, in the prov. of W. Flanders. It lies in flat agricultural country, 11 m. by rly. S.W. of Bruges, and is a rly. junction. There is a busy agricultural trade, and industries

in cloth, tanning, lace-making, chicory, etc. Pop. 11,000.

Thousand Islands. Group of islands and islets in N. America. At the E. end of Lake Ontario, where the St. Lawrence leaves the lake, it is divided by the international boundary between Canada and the U.S.A., and extends for 40 m. with a breadth of the river of 4 to 7 m. Of the larger islands Wolfe and Howe belong to Canada, and Wells and Carlton to the U.S.A. Many of the islets are private property and contain fine villas. The whole group forms one of the beauty spots of N. America and is much frequented by summer visitors. The total number of islands in the group is 1,700.

Thrace (Gr. *Thrakē*; Lat. *Thracia*). In ancient geography, a country in the E. of the modern Balkan peninsula. It varied in extent from time to time, but its boundaries may be roughly stated as on the N. the Danube, E. the Euxine, S. the Aegean and Propontis, W. Macedonia. The Haemus or Balkan range traversed it from E. to W.; the chief rivers were the Strymon (Struma) and Hebrus (Maritza). The land, though fertile in parts, was little cultivated; but minerals abounded, and the gold mines of Mt. Pangaea were the richest known to the ancient world. Trading possibilities led the Greeks to establish numerous colonies on the south and east coasts. Thrace was the reputed home of the semi-legendary Greek poets Orpheus and Linus, and of the cult of Ares. The inhabitants were chiefly occupied in war and the chase.

Subjected to Persia in the time of Darius, Thrace regained independence after the disastrous expedition of Xerxes. Its most flourishing period was under the rule of its princes Sitalces and Cotys in the 5th and 4th centuries B.C. Conquered by Philip of Macedon, and after the downfall of Macedonia under Roman sway, it became a province in A.D. 46. When Theodosius, at his death in 395, divided the empire, Thrace became part of the eastern empire.

Thrace was part of the district conquered by the Turks, and it remained in the sultan's empire until 1878. The northern part of it was then included in the state of Bulgaria, which country obtained the south-western section in 1913, as a result of the Balkan Wars. In 1919, after the First Great War, the whole of it was assigned to Greece, but by the treaty of Lausanne (1923) Turkey was given

eastern Thrace up to the Maritza. Bulgarians, invading Greece in company with the Germans, occupied Greek Thrace, April, 1941, and six months later annexed it. During their occupation, which lasted until the armistice between Bulgaria and the Allies, Oct. 28, 1944, they did all they could by closing schools, expelling teachers, lawyers, priests, doctors, and others, by massacres and other forms of terrorism, to "Bulgarise" the area, and give it a Bulgarian majority. Bulgarians were removed under the armistice; but these wartime activities contributed to the confusion and unrest in the area during the Greek civil war of 1946 onwards. Area of the Greek portion of Thrace, 3,315 sq. m.; pop. 354,889.

Thrale, HENRY (1728-81). English brewer. Son of Ralph Thrale of Offley, Herts, he in-



Henry Thrale,
English brewer

herited his father's brewery business in 1758, and in 1763 married Hester Salusbury. M.P. for Southwark, 1765-80, he is remembered chiefly as the friend and host of Dr. Johnson at Streatham Park. He died of apoplexy April 4, 1781. Mrs. Thrale later married Gabriel Piozzi, an Italian musician, and details of her life will be found under Piozzi. See also Johnson, S.

Thrasea Paetus, PUBLIUS (d. A.D. 66). Roman aristocrat. A senator of large means and philosophy temper, who was consul in 56, he became obnoxious to Nero by his openly expressed disgust for the new regime and regret for the old republic. He absented himself from the funeral of Nero's wife Poppaea Sabina, and refused to subscribe to emperor-worship. In 66 he was condemned to death on trumped-up charges. Thrasea married Arria, a daughter of the heroic Arria (q.v.), and was father-in-law of Helvidius Priscus.

Thrasybulus. Athenian statesman and general. He assisted in the overthrow of the tyranny of the Four Hundred in 411 B.C., but when the new oligarchy of the Thirty Tyrants was established by the Spartans after the capture of Athens in 404 he suffered banishment. With the help of the Thebans he collected a force for the re-establishment of the democracy at Athens, and by the autumn of 403 he had accomplished his ob-

ject. He met his death while in command of the Athenian fleet in the Aegean Sea (390-389).

Thread (A.S. *thraed*, that which is twisted). Two or more yarns of cotton, linen, flax, or silk tightly twisted together for use in sewing or weaving. The word is also used for the filament of any fibrous substance or of a flower, for the spiral part of a screw (q.v.), in mining of a very thin seam, and also of that which runs through a series of things, connecting them together, as the thread of an argument. See Cotton; Sewing Machine.

Threadneedle Street. London thoroughfare. It runs S.W. from Bishopsgate to the Bank of England, by the enlargement of which and the rebuilding of the Royal Exchange its length was curtailed. First mentioned by Stow, 1598, as Three Needle Street, and assumed to have been so called from a sign of Three Needles, it contains in addition to the Bank (famously called The Old Lady of Threadneedle Street), other fine buildings, including those of banks and the Sun Insurance co., while at No. 30 is Merchant Taylors' Hall. South Sea House stood on its N. side. In a house on the site of part of the house and hospital of St. Anthony lived the ancestors of Sir Philip Sidney.

Threadworm OR NEMATODE. Low form of animal life which may be found in water, damp earth, and decaying animal or vegetable matter. Nearly all examples are parasitic, but while some are so all their lives, others are free as larvae, and parasitic as adults. Nematodes are without any respiratory or vascular system, yet the sexes are usually separate, the female being larger than the male. Worms in dogs, strangles in horses, cattle, and sheep, gapes in poultry, trichina in hogs, and many other diseases are caused by these pestilent parasites. Other varieties are responsible for diseases to which cultivated plants are subject, such as ear-cockles in corn, and the sickness of beet.

Threat. Term used in English law for pressure by intimidation. To demand any property, money, etc., by threats, with intent to steal the property, is a felony. To send a letter or writing threatening to accuse any person of a serious crime punishable with death or 7 years' imprisonment, or of a rape or an attempt to commit a rape, or of any infamous crime, is a felony; even to threaten verbally to accuse any person of an infamous crime with intent to extort money is also

a felony. It is a misdemeanour to threaten to publish a libel with intent to extort money, and it is a felony maliciously to send or to cause to be received any letter or writing threatening murder, or threatening to burn any building or any rick or stack of grain, hay, or straw, which is in or under any building, or any ship or vessel, or to kill, maim, or wound any cattle.

Magistrates have power to grant a summons to anyone who has been threatened by another with harm to himself, his wife, or child. On the hearing of the summons, if the threats are proved, the magistrates have power to bind the defendant over to keep the peace; and may also demand that he shall find sureties. *See* Surety.

Three-Card Trick. Trick in which three playing cards, one usually the queen of spades, are held face downwards, two between the fingers and thumb of one hand and one between those of the other, the backs of the hands being uppermost. The cards are exposed for a short time by turning or raising the hands and are then jerked quickly face downwards side by side on to a table or board. Punters are asked to "find the lady," i.e. to bet which card is the queen. Sharpers use many devices to mislead the victim.

Three Choirs Festival. English musical festival, normally held annually in Sept. in the cathedrals of Gloucester, Worcester, and Hereford in turn. The festival was started in 1724. The music of Elgar and Parry was particularly advanced by it.

Three Cities. Commercial centre of Hupeh prov., China. All on the Yang-tse, the cities are Hanyang, Hankow, and Wuchang, respectively in the S.W., N., and S.E. of a triangle. This vast metropolis is sometimes known to the Chinese as Wu-Han.

Three Kings of Cologne. Name sometimes given to Caspar, Melchior, and Balthasar, the wise men from the East who visited Bethlehem at the birth of Jesus. Their bodies are said to have been taken to Constantinople by the empress Helena in the 4th century; thence they were removed to Milan, and Frederick Barbarossa on taking that city in 1162 presented them to the archbishop of Cologne.

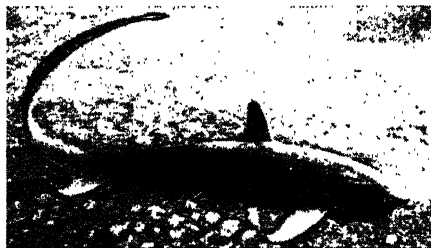
Three Men in a Boat. Humorous work of fiction by Jerome K. Jerome, published 1889. Though originally intended as a series of light essays on the scenic and historical aspects of the Thames, the author's sense of fun took control

from the start and it became a highly diverting personal account of the misadventures on a river trip of three high-spirited young men—Harris, George, and the narrator, J.—and, as the full title adds, "not forgetting the dog," Montmorency. The book established its author's reputation and became a classic of English humour. A further book introducing the same characters on a Continental holiday, *Three Men on the Bummel*, 1900, was less popular.

Three-Mile Limit. This conception in international law is discussed under Territorial Waters.

Three Musketeers, THE. Romance by Alexandre Dumas, in collaboration with Auguste Maquet. First published in 1844, it is based on the *Mémoires d'Artagnan* by Courtels de Sandras. With a background of French court life in the time of Richelieu, it has for its central figure the witty and resourceful D'Artagnan, who, with his three friends the musketeers, Athos, Porthos, and Aramis, has a succession of romantic and perilous adventures. Sequels were *Twenty Years After*, and *Le Vicomte de Bragelonne*. The *Three Musketeers*, based on Dumas' work, was one of Douglas Fairbanks's best films.

Three Rivers. City and port of Quebec, Canada. It is 86 m. N.E. of Montreal, on the N. side of the St. Lawrence, at its junction with the St. Maurice, the name being due to the fact that the latter has two mouths. The city is served by the C.P.R. and C.N.R., while a ferry gives access to the S. side of the St. Lawrence. It has a fine harbour and ample wharves, from which much lumber is ex-



Thresher. Shark of the Atlantic and Pacific Oceans, a visitor to the British coasts in summer, showing the long upper lobe to the tail fin
W. S. Berridge, F.Z.S.

ported; it makes pulp and paper, and has iron foundries and a cotton mill. The business part of the city was almost destroyed by fire in 1908, but rebuilt. Pop. 44,515.

Three Sisters, THE. Play by Chekhov. It concerns three girls who pass their youth in the restricted surroundings of a provin-

cial town where they are fated to lose their ideals of love and happiness. Produced by Stanislavsky at the Moscow Art Theatre, 1901, it was first given in London in Constance Garnett's translation at Barnes Theatre, Feb. 16, 1926, when it was produced by Theodore Komisarjevsky. Notable revivals were at the Fortune Theatre, 1929; Old Vic, 1935; Queen's, 1938.

Three Taverns. (Lat. Tres Tabernae). Former village of ancient Latium, Italy. Probably situated 3 m. beyond the modern Cisterna di Roma, a small town with a castle of the Caetani, 38 m. S.S.E. of Rome, it was a station on the Appian Way. It is mentioned in Acts 28, v. 15, as the meeting-place of S. Paul and his friends, who came to greet him on his way to Rome.

Threnody (Gr. *thrēnos*, lamentation; *ōdē*, song). Term used for a dirge or funeral ode. In classical times threnodies were often specially composed in honour of a dead man. *See* Ode.

Thresher or FOX-SHARK (*Alopias vulpes*). Shark of the family Lamnidae. It is a native of the temperate and tropical waters of the Atlantic and Pacific, commonly visiting the S. and W. coasts of England during the summer. It is a very dark blue on the upper surface, paling to whitish on the under-side; the body is cylindrical, the dorsal fin high, and the pectoral fins are long, while the upper lobe of the tail fin is equal in length to the head and body. The total length may be 15 ft. *See* Shark.

Threshing. Agricultural process separating the grain from the earincrops. It is usually done by machinery, but the flail is still used for threshing wheat in parts of the East. There also a weighted sledge may be pulled across the corn on the threshing floor.

In 1636 Sir John van Berg patented a threshing of several flails operated by cranks. In 1732 Michael Menzies invented a machine which, according to him, in a min. gave 1,320 strokes or as many as 33 men threshing briskly. But not until 1786 was the first practical threshing machine evolved by Andrew Meikle of E. Lothian. The essential feature of this machine was a rotary drum fitted with fluted beaters, which worked in a concave.

Ties a striking and a rubbing motion were for the first time combined. These features were preserved in later threshing machines, which not only separate the grain from the ear, but clean it. By various blasts and riddles, the chaff is first removed; poppy and thistle heads are cleared away; then a seed riddle holds up the grain, but gets rid of small weed seeds such as charlock and dock.

After this process is complete, a further series of cylindrical wire screens separates the true seed into three grades, namely seed corn, seconds, and tailings. Clover seed requires not only careful threshing, but also rubbing or hulling, and as a rule two separate machines are used for the work. The seed of turnip and other cruciferous plants is extracted by laying the stalks on large sheets in the open, and drawing across them heavy iron rollers. Mangold seed is frequently threshed by machinery.

Formerly the threshing machine was usually driven by a steam engine. Now the common and less expensive practice is to use a tractor. Either method may result in threshing 80 sacks of wheat a day, but fine weather is essential, for not only does the dry grain come out from the ear in far better condition, but a wheat rick may be entirely ruined if wet weather comes on when it has been opened for threshing. Machines which cut and thresh corn in one operation, introduced in N. America, where harvesting almost invariably takes place in dry weather, have been adopted to some extent in the U.K. See Agriculture; Barley; Farm illus.; Flail; Oats; Wheat.

Thrift or **SEA-PINK** (*Armeria vulgaris*). Perennial herb of the family Plumbaginaceae. A native of Europe, Asia, N. America, and Chile, it forms cushion-like tufts on the rocks of sea-shores and high mountains, and has very slender,



Thrift. Rosy flower-heads of the Sea-Pink growing on cliffs

stiff leaves growing in bundles from the woody branches of the root-stock. The funnel-shaped rosy flowers are massed in half-round heads at the summit of a hairy scape. See Leaf.

Thring, EDWARD (1821-1887). British schoolmaster. Son of the rector of Alford, Somerset, he was born Nov. 19, 1821, and educated at Eton and King's College, Cambridge, of which he became a fellow. In 1846 he was ordained, and in 1853 chosen headmaster of



Edward Thring, British schoolmaster

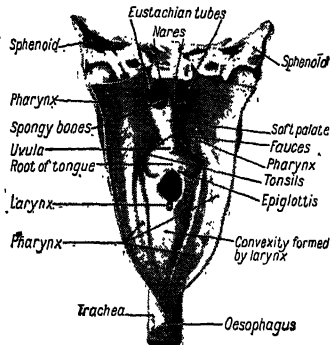
Uppingham, where he remained until his death on Oct. 22, 1887. Under Thring Uppingham became one of the great English public schools, its 25 boys being increased to 300. His success was due to the introduction of new teaching methods, wider studies including art and music, and an emphasis on moral values. Founder of a school mission, the first of its kind, in London, he was an indefatigable worker for the benefit of teachers. Consult The Man Who Made a School, G. Hoyland, 1946.

Thrips. Group of minute insects, forming the order Thysanoptera (Gk. *thysanos*, fringe; *pteron*, wing). Few are longer than a millimetre. Four narrow bar-like wings, fringed on both sides by long closely set hairs, are characteristic, and the mouth-parts are for piercing and sucking. Feeding on plants, the pea thrips and onion thrips are very destructive.

Throat. In man, part of the body extending from the base of the tongue to the trachea or windpipe, which can be felt in the middle line at the lower part of the front of the neck. It is the organ for the production of sound; also it affords passage to food and drink on their way to the stomach, and air on its way to the lungs.

The beginning of the throat is presented on looking into the widely opened mouth. In the middle line above is the uvula, hanging from the soft palate. On either side the soft palate becomes continuous with the two pillars of the fauces, and, below, these again are continuous with the root or base of the tongue. Between the pillars of the fauces on either side are the tonsils. Above and behind the soft palate is the nasopharynx, into which the posterior ends of the nostrils open.

To carry out an examination of the throat a laryngoscope (*q.v.*) is needed. Projecting upwards in the middle line at the base of the tongue and just invisible without the aid of the laryngoscope is a leaf-like structure called the epiglottis. From each side of this two folds project backwards and touch one another behind, leaving a triangular interval, which is the entrance to the larynx or air passage. Behind the place where these bands join is a narrow chink, forming the entrance to the gullet or food passage. Food is prevented from entering the larynx by a muscular mechanism that completely closes



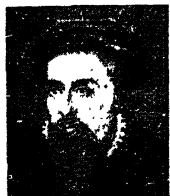
Throat. Diagram indicating position of the principal parts of the human throat. See text

the entrance to the larynx as it opens the entrance to the gullet.

The vestibule of the larynx contains two fleshy-looking bands, called the false cords, highly developed in the lower animals. Still deeper in the larynx are two thinner pearly-white bands. These are the true vocal cords, the essential organs of sound. They are enclosed in a more or less rigid box of cartilage, the front of which can be seen externally in the middle line of the neck and is popularly known as Adam's apple. The chink between the two cords is the narrowest part of the throat, and, below, it expands again to become continuous with the windpipe or trachea, which carries the air onwards into the lungs. See Anatomy; Diphtheria; Epiglottis; Larynx; Quinsy; Sound; Tonsil; Trachea; Voice.

Throgmorton or **THROCKMORTON**, SIR NICHOLAS (1515-71). English diplomatist. Son of a Warwickshire knight, and brought up at court, he entered parliament in 1545, and served in the Scottish campaign of 1547. Despite grave suspicions as to his loyalty at the time of the Lady Jane Grey episode, he gained the confidence of

Mary. Elizabeth sent him as ambassador to France, 1559-64, and in Paris he formed a friendship



Sir Nicholas Throgmorton, English diplomatist
After G. Vertue

with Mary Stuart, whom he assisted to return to Scotland, and whose marriage with Darnley he was vainly dispatched north to prevent in 1565. Equally unable, two years later, to secure Mary's release from the nobles who had imprisoned her, he returned to England. He died Feb. 12, 1571. His daughter Bessie was the wife of Raleigh.

Throgmorton Street. London thoroughfare. It links Lothbury with Old Broad Street, and was named after Sir Nicholas Throgmorton. Drapers' Hall is on the N. side, and on the S. is the Stock Exchange (*q.v.*).

Thrombin. Proteolytic enzyme operating in the normal clotting of blood, when its action on fibrinogen (a soluble protein present in blood) gives rise to insoluble fibrin. Thrombin is not present as such in blood, but is formed by the interaction of prothrombin, thromboplastin, and calcium. Normally the activity of thrombin is checked by the presence in the blood of an antiprothrombin, but when external wounds occur a substance (thromboplastin) is released which neutralises the antiprothrombin and so permits clotting to take place. See Blood.

Thrombosis (Gr., curdling). Formation of a clot of blood in a blood-vessel, usually a vein. It may result from injury or inflammation of a vein; thickening of the coats of an artery in old age; or a drop in high blood pressure, when the slowed stream tends to bank up material against a damaged wall. Thrombosis of a vessel in the brain may lead to paralysis or loss of mental function. See Embolism.

Throne. Royal or episcopal chair of state. The use of a raised seat as a symbol of authority is almost universal and of great antiquity. The splendour and wealth of the state were therefore usually reflected in the magnificence of the chair upon which its monarchs were officially placed, *e.g.* Solomon's throne of ivory and gold; the peacock throne at Delhi, valued at several million pounds sterling. The royal throne in the house of

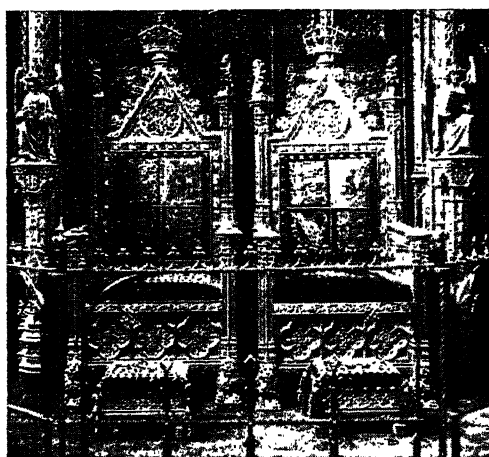
lords at Westminster is occupied by the sovereign only when opening or proroguing parliament. Episcopal thrones are placed in cathedral chancels and are occupied by the bishop of the diocese, whose official installation is usually known as his enthronement. See Coronation; King.

Thrums. Name of a Scottish village as it figures in several books by Barrie (*q.v.*), *e.g.* *Auld Licht Idylls* and *A Window in Thrums*. The prototype of Thrums is Kirriemuir, Angus, birthplace of the author, which has many features recognizable from the stories. Thrums is a term used in weaving for the offcuts from wool or other material left on the loom; they are often used for making rugs.

Thrush. Large family of songbirds (Turdidae), of which six species occur in Great Britain. These are the song thrush, missel thrush, blackbird, ring-ouzel, fieldfare, and redwing. The first three are to be met with all the year round; the ring-ouzel is seen only in summer; the fieldfare and redwing are winter visitants. See articles on each of the birds named.

Thrush. Inflammatory condition of the mucous membrane of the mouth due to infection by a fungus belonging to the yeast family. It is most often met with in children and usually results from improper diet, uncleanness of the mouth, or acid fermentation of remnants of food. Slightly raised white spots are seen on the tongue and inside of the mouth. These gradually extend and may coalesce. Treatment consists in cleansing the mouth with dilute solution of borax, potassium permanganate, or, best of all, sodium sulphite. The general health must also be attended to.

Thrust. In geology, name given to a type of fault or break in the earth's crust along which the rocks on one side have been pushed forwards and upwards relative to the rocks on the other side. The surface along which the movement occurred is called the thrust plane. It is usually gently inclined or nearly flat. The upper rocks in



Throne. Royal thrones in House of Lords. The consort's, right, is one inch lower than that of the Sovereign

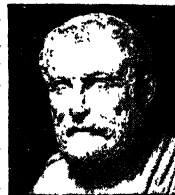
some examples have been pushed many miles over those below the thrust plane. Thrusts are typically associated with mountain-building movements, *e.g.* in N.W. Scotland, Scandinavia, the Alps, the Appalachians, Rocky Mts. See Earth Movement; Fault; Moine Thrust.

Thrust. Term in ballistics to describe the pressure exerted on the base of a projectile by the gases generated through explosion of the propellant charge. It is expressed as $P = WV^2/2gL$ where P is the mean thrust in lb. on the base of the projectile; W , the weight of the projectile in lb.; V , the muzzle velocity in ft. per sec.; g , the acceleration due to gravity; L , the length of barrel in ft.

In aeronautics, thrust is the ability of an airscrew to grip the air, its degree depending on the circumference and pitch of the propeller. The term thrust is also used in mining to describe the tendency of the roof of a working to bulge as the coal is cut away; this is countered by propping.

Thucydides (c. 464-c. 404 B.C.). Greek historian.

Of wealthy Athenian family, he received an excellent education, for among his teachers are said to have been the philosopher Anaxagoras and the orator Antiphon. During the eighth year of the Peloponnesian War, 424, Thucydides was in command of an Athenian fleet detailed to



Thucydides, Greek historian
From a bust

protect the coast of Thrace, where he owned some gold mines. His failure to prevent Amphipolis from falling into the hands of the Spartans, attributed to his anxiety to save his own property, led to his exile for 20 years.

At the beginning of hostilities he had begun to write the history of the war, "believing that it would be great and memorable above any previous war." Events justified his judgement, for the Peloponnesian War proved to be a 27 years' fight to a finish between Athens and Sparta for the hegemony of the Greek world. Thucydides's history in eight books gives an account of the struggle to 411, though the war did not end until the surrender of Athens to Lysander in 404.

The work is characterised throughout by the most scrupulous accuracy. Thucydides took the utmost pains to verify the facts. Furthermore, the tone of the work is absolutely impartial throughout. The love of Thucydides for Athens, and his admiration for his native city as the intellectual light of the Greek world, did not blind him to her defects and mistakes, and he holds the balance equally between her and her enemies. But he is not content merely to give an accurate and impartial narrative; he endeavours to show the causes that underlay the events he describes.

In this respect he is the first and remains the greatest of philosophical historians. A notable feature of the work is to be found in the speeches which he puts in the mouths of prominent men on both sides, such as the magnificent funeral oration delivered by Pericles on the Athenians who had died in the first year of the war. Some of these speeches were undoubtedly the substance of what the speakers actually said; others are no more than a convenient means of giving expression to sentiments proper to the occasion and to the character of the speaker. The style of Thucydides is often harsh and obscure, yet as a work of literary art the history as a whole takes the highest place. Macaulay regarded the account of the Athenian expedition to Sicily as the finest prose composition in the world, and its author as the greatest historian. See Greek Literature; Peloponnesian War. *Pron.* Thew-siddy-deez.

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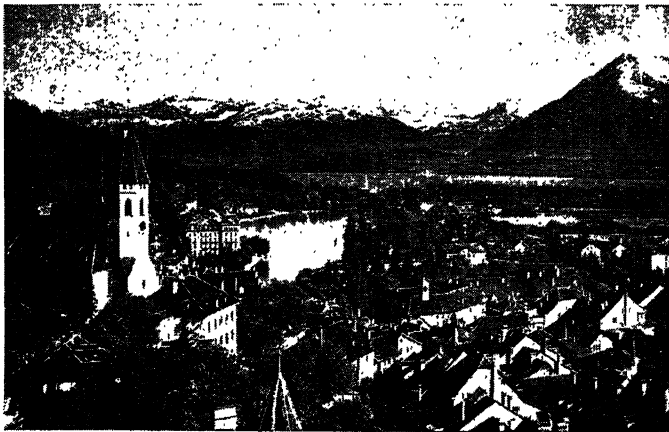
Thucydides (5th cent. B.C.). Athenian statesman. After the death of Cimon in 449 B.C. he became leader of the aristocratic party, and thus the opponent of Pericles. He suffered ostracism (q.v.) in 443.

Thug (Hind. *thag*, deceiver). Term applied to a fraternity of murderers and robbers formerly infesting India, who strangled unsuspecting travellers with a noose, handkerchief, or turban, and then robbed and buried them. They were also called phansigars

It has a hexagonal close-packed structure. Discovered in 1879, it was not isolated until 1900. Thulium is found in ytter spar, euxenite, samarskite, and other minerals. It forms green salts and has a white oxide.

Thumbscrew or **THUMBKINS**. Instrument of torture for compressing or breaking the thumbs. It was much used in Spain during the Inquisition, and in Scotland during the persecutions of the Covenanters, for extracting confessions or recantations.

Thun. Lake of Switzerland, in the canton of Berne. Situated W. of Interlaken, and traversed by the



Thun. The Swiss lake with the town of Thun in the foreground

(noosers). Sometimes they used the datura, or thorn-apple, to stupefy their victims. Their secret jargon was called Ramasee. The early Thugs were Muslims, but later Hindus were initiated, and Thuggee became an institution in honour of and under the protection of the Hindu goddess of destruction, Kali. Systematic suppression started in 1830, and by 1848 organized Thuggee was stamped out.

Thulé. Name given by ancient writers to a remote land in the northern seas, often called Ultima Thule. It has been variously identified with the Orkneys, the Shetlands, Iceland, and even with Norway. First mentioned by Pytheas (q.v.) of Marseilles, it was said by him to be six days' sail from Britain. *Pron.* Thew-lee.

Thulite. In mineralogy, name given to a variety of zoisite. It is a basic calcium and aluminum silicate, rose-red in colour, and is sometimes used ornamentally.

Thulium. One of the yttrium group of rare earth elements. Its chemical symbol is Tm; atomic number 69; atomic weight 169.4.

river Aar, which issues from Lake Brienz, it is 11 m. in length, with a breadth averaging 2 m. Its maximum depth is 710 ft., and it lies at an alt. of 1,839 ft. At its W. extremity it receives the waters of the Simme. Area nearly 19 sq. m.

Thun (Fr. *Thoune*). Town of Switzerland, in the canton of Berne. It stands on the river Aar, about 1 m. from Lake Thun, 19 m. by rly. S.S.E. of Berne. Dominated by a 15th century feudal castle, it is a picturesque town, commanding views of the Bernese Oberland. It is the headquarters of the Swiss artillery. Pop. 20,239

Thunder. Noise which accompanies or follows a flash of lightning. It is due to vibrations set up by the sudden heating and expansion followed by the rapid cooling and contraction of the air along the path of the lightning discharge. Thunder is rarely heard beyond 10 m.; the distance at which the lightning occurs can be estimated by timing the interval between seeing the flash and hearing the thunder, reckoning 1 m. for every 5 secs. Rolling of thunder occurs

chiefly because the sound from different parts of the lightning channel reaches the observer at different times. *See* Electricity; Atmospheric; Lightning; Meteorology.

Thunderbolt. Name under which the British submarine *Thetis* (*q.v.*) was recommissioned.

Thunderstone. Name given to objects found in the ground, regarded in popular superstition as the material agents of lightning flashes and their accompanying thunder-claps. In Japan they are called thunder-mallets. They may be meteorites, nodules of iron pyrites, belemnites, and other fossil cephalopods, or prehistoric stone implements, especially arrow heads and axes. In various parts of Europe they are still preserved in the house as lightning protectors, or placed over the lintels of cowsheds and in water-troughs for averting disease. These amuletic and other magical uses are also widespread throughout Asia and Africa. *See* Belemnoides.

Thunderstorm. Violent disturbance of the atmosphere caused by powerful rising currents of air within fully developed cumulonimbus clouds. Thunderstorms, usually "heat" or "frontal," are due to marked instability in the atmosphere. Adequate moisture and a sufficiently large lapse rate of temp., extending to at least 10,000 ft. above the cloud base, are necessary conditions for the development of thunderclouds. As a result of the violent convective movements of air in a thundercloud, positive and negative charges of electricity accumulate in different regions of the cloud; a lightning discharge is initiated when the difference in potential reaches a sufficiently high value.

Heat storms, generally the most severe, are local and are most frequent over mountainous regions in tropical lats., *e.g.* at Buitenzorg, Java, thunder is reported on 260 days in the year. In the U.K. the main risk is during afternoon and evening in summer, especially in the E. and Midland cos., where convective activity in the prevailing westerlies is greatest. Frontal storms frequently sweep broadside over the country with the cold front separating the cold and warm air currents of a depression; at other times, they develop along a belt and move on, occasionally lasting for several hours at one place. There are more depressions crossing the U.K. in winter than summer; hence frontal storms are more frequent there in winter. Warm-front

thunderstorms are less common. Heavy rain or snow showers and hail are typical features of thunderstorms; a frontal storm is usually accompanied by wind squalls, a sudden rise in barometric pressure, and a fall in air temp. It has been estimated that the earth experiences 16 million thunderstorms a year. *See* Lightning.

Thurber, JAMES GROVER (b. 1894). American writer and artist. Born Dec. 8, 1894, and educated



James Thurber,
American writer
and artist

at Ohio state university, he became a journalist and in 1927 joined the staff of the *New Yorker*. A master of humorous understatement, he attracted a British as well as an American public for articles and books in mock-serious manner illustrated by himself. His satire was kindly, and his witty pen drawings were distinguished by rigid economy of line and absence of detail. *Is Sex Necessary?* (with E. B. White) appeared in 1929; *The Owl in the Attic*, 1932; *My Life and Hard Times*, 1933; *Let Your Mind Alone*, 1937; *Fables for Our Time*, 1941; *Men, Women, and Dogs*, 1943. The Thurber Carnival, 1945, was a collection.

Thurgau (Fr. Thurgovie). Canton of N.E. Switzerland. It is bounded N. and N.E. by the Rhine and Lake Constance, W. by Zürich, and S. by St. Gallen. One of the least mountainous of the Swiss cantons, its surface is undulating, and it ranks among the most fertile regions of the country. It is traversed by the river Thur. The capital is Frauenfeld (*q.v.*), and the chief port is Romanshorn, on Lake Constance. Thurgau joined the Swiss confederation in 1803. Its area is 388 sq. m. Pop. 138,122.

Thurifer (Lat., incense bearer). Attendant in the R.C. ritual who carries the thurible or censer at ceremonial services. His chief duties are to keep the incense burning by swinging the censer, and to hand it to the priest for censuring the altar. *See* Mass.

Thuringia. Land of E. Germany. A free state from 1919 to 1934, a *Gau* under the Nazi regime, Thuringia was created by the merging of seven small duchies and principalities: Saxe-Weimar-Eisenach, Saxe-Meiningen, Saxe-Coburg-Gotha (partly), Saxe-Altenburg, Reuss, Schwarzburg-

Rudolstadt, Schwarzburg-Sondershausen. Its area was 4,540 sq. m.; pop. (1934) 1,676,759; capital, Weimar; university city, Jena; other towns, Eisenach and Meiningen. The Thuringians contain Frankish and Slavonic elements and are almost exclusively Protestant. Thuringia embraces a mainly mountainous area, with lower hills in the N. and W., between 380 and 3,200 ft. Its soil contains iron and copper ore, slate, kaolin, salt, and lignite, and traces of oil. The region is largely industrial, engaged in toy-making, glass, textile, and engineering industries, pottery, and making footwear and chocolate. Mining, once important, is nearly extinct, while agriculture is difficult and unrewarding. Thuringia is crossed by two main rly. lines, Berlin-Frankfurt-on-Main and Leipzig-Cologne. Its chief rivers, the Werra and the Saale, leading respectively to the Weser and the Elbe, are not navigable here. There are famous health resorts.

History goes back to a Thuringian kingdom, which was destroyed by allied Franks and Saxons in 531 and under Frankish dukes until 1050. The Ludoving dynasty then established its rule on the Wartburg and in 1130 its chief was appointed landgrave of Thuringia. Ludwig IV (1217-27) was the husband of S. Elizabeth. In 1263 Thuringia fell to the Wettin (Saxon) dynasty, which split it into its several states between 1445 and 1547. These were abolished 1918 and merged 1920, with the exception of Coburg and a surrounding area which joined Bavaria. In Thuringia, in 1930, a Nazi (Frick) became for the first time minister of a German state. Taken by British and American forces 1945, Thuringia became part of the Russian zone of occupation. In 1946, enlarged by former Prussian territory, it was created a *Land*, with pop. 3,000,000.

Thuringian Forest (Ger. Thüringer Wald). Mt. range of Germany. It extends for 60-70 m. in a N.W. direction from the Frankensteinwald to Eisenach. The highest points are the Gross Beerberg (3,238 ft.) and the Schneekopf. Forested to the summits, the range is a favourite tourist resort. Iron, copper, manganese are mined.

Thurles. Market town of co. Tipperary, Eire. Situated on the Suir, it is 29 m. N. of Clonmel, with a station on the Eire state rlys. The castle was formerly a stronghold of the Butlers, and Viscount Thurles remains a title in

the family peerage of Ormonde. Thurlis is the seat of the R.C. bishop of Cashel. Hurling championship matches are played here. Market days, Wed. and Sat. Pop. 3,300. *Pron.* in two syllables.

Thurlow, JOHN (1616-83), English politician. Son of an Essex clergyman, he was educated for the law, and became a member of Lincoln's Inn in 1647. After acting as secretary to a mission to Holland, 1651, he became secretary to the council of state in 1652, with a residence at Whitehall. Under Cromwell he was in charge of the intelligence department. After the protector's death Thurlow became Richard's chief adviser, and even after the Restoration was constantly consulted by Charles II. He died Feb. 21, 1688. The famous Thurlow Papers discovered at Lincoln's Inn are preserved partly in the Bodleian and partly in the British Museum.

Thurlow, EDWARD THURLOW, 1st BARON (1731-1806). British lawyer and politician. Born near Norwich, Dec. 9, 1731, the son of a clergyman, he was educated at Canterbury and Caius College, Cambridge. Called to the bar in 1754, he made his name in the case of Douglas v. Hamilton,



1st Baron Thurlow,
British lawyer

1769. Just before this he had entered parliament for Tamworth, and in 1770 he was made solicitor-general. In 1771 he was promoted attorney-general, and from 1778, apart from a short interval, he was lord chancellor until 1792, when he received a barony, but was dismissed a few days later for opposing Pitt's sinking fund bill. Thurlow died at Brighton, Sept. 12, 1806. A strong Tory, he was a patron of Johnson and Eldon and sarcastic towards the American colonists and all Radicals.

Thurn, HEINRICH MATTHIAS, COUNT VON (1567-1640). Bohemian Protestant leader, born Feb. 24, 1567. Having distinguished himself in wars against the Turks, he became a leader of the resistance against Rudolph II, and in 1609 helped to secure



Count von Thurn,
Bohemian
Protestant leader

the chief claims of the Bohemian Protestants. Giving the signal for the famous "defenestration" of Prague, May 23, 1618, Thurn precipitated the Thirty Years War, in which he led a Bohemian army into Austria, and laid siege to Vienna. Defeated at the battle of the White Mountain, 1620, he fled into Transylvania and served in the army of Gustavus Adolphus. In 1633 he was captured at Steinau but was released. He died Jan. 28, 1640. *Pron.* Toorn.

Thurn und Taxis. Name of a princely German family. It is descended from the originally Milanese family, della Torre, which was driven out of the city and settled at Tasso, near Bergamo. Both names were joined in 1650. In 1501 Francis von Thurn, or Tassis, obtained from the Hapsburg dynasty postal privileges between Vienna and the Netherlands; these being extended through the empire, the family gained great wealth and, under its German name, princely rank in 1695. After buying estates in central and S. Germany, with the rights of sovereign rulers, and receiving other territories as compensation for giving up part of their postal monopolies—the last in 1866, upon receiving from Prussia £450,000 and a principality in Poznan—they were endowed with hereditary seats in the Prussian, Austrian, Bavarian, and Württemberg first chambers, and in 1899 with the Bavarian rank of duke. Related to the ruling house of Bavaria, they resided at Regensburg until 1918, while a younger branch lived in Bohemia. They kept politically in the background during the Weimar and Nazi periods.

Thurot, FRANÇOIS (1726-60). French sailor. Born at Nuits, Côte d'Or, July 22, 1726, he learnt seamanship on privateers. A distinguished seaman during the Seven Years War, he harassed English shipping in the North Sea, and in 1760 landed at Carrickfergus, Ireland, but soon after was defeated by Hawke in Luce Bay, Wigtownshire, and fell in the action.

Thurrock. Urban dist. and co. constituency of Essex, England. The urban dist. was formed by an amalgamation of Grays, Tilbury, Purfleet, and the rural district of Orsett. The administrative centre is Grays, situated on the N. bank of the Thames, 20 m. E. of London. The area is served by rly. At Tilbury are docks of the P.L.A. Industries include the manufacture of cement, paper board, margarine,

footwear, and soap, and extensive petroleum refineries. Chalk, sand, and gravel are quarried in many parts of the area. Agriculture and market gardening are also valuable. Pop. 74,000.

Thursday. Fifth day of the week. The name commemorates the Scandinavian god Thor, whose association with thunder is seen in the German word for Thursday—Donnerstag. Thor was identified with Jupiter, and Thursday was called by the Romans Dies Jovis (day of Jove), *cf.* *Fr. jeudi*.

Thursday Island. One of the smallest of the Australian islands, in Torres Straits. It is 30 m. N.W. of Cape York, Queensland, and some 1,430 m. by sea from Brisbane. Port Kennedy, its harbour, is the port of call for British, Dutch, and Chinese steamers. It is a naval coaling station, and the headquarters of Queensland pearl and trepan fisheries. During the Second Great War the civilian population was removed. Pop. 944.

Thurso. Mun. burgh and seaport of Caithness, Scotland. It stands on the S. shore of Thurso Bay at the mouth of the Thurso river, 21 m. N.W. of Wick and 319 m. N. of Edinburgh by rly., and is the most N. town of Scotland. There are steamer services to the Orkney Islands and the E. coast of Scotland. There are ruins of an episcopal palace, burnt in 1222; the castle, seat of the Sinclairs; and Harold's Tower, which marks the grave of Earl Harold, killed in battle, 1190. Thurso was created a burgh in 1633. It was for long the chief port for trade with Scandinavia. In the 14th century the place was so important that its weights and measures were adopted for the whole country. Pop. 3,250.

Thurstan (d. 1140). English prelate. A priest of Norman origin, he entered the service of Henry I. In 1114 he was made archbishop of York, but as he refused to admit that York was under the authority of the archbishop of Canterbury he was forced to leave the country, and the quarrel involved king and popes. In 1119 he was at length consecrated, and in 1121 he returned to England. Thurstan was a leader at the battle of the Standard, and died at Pontefract, Feb. 6, 1140.

Thurston, ERNEST TEMPLE (1879-1933). British novelist and playwright. Born Sept. 23, 1879, he issued his first work, some poems, as early as 1895, and his first play, *Red and White Earth*, came in 1902. A succession of novels, attractively written, but

sometimes marred by over-sentimentalism, include *The Apple of Eden*, 1904; *Sally Bishop*, 1908; *The City of Beautiful Nonsense*, 1909; *The Greatest Wish in the World*, 1910; *The Forest Fire*.



E. Temple Thurston, British novelist

1919; *The World of Wonderful Reality*, 1920; and *Jane Carroll*, 1927. He dramatised a novel by his first wife, K. C. Madden, *John Chilcote*, M.P., 1905, and his other plays include *The Greatest Wish*, 1913; *Always Tell Your Wife*, 1913; *The Wandering Jew*, 1920; and *The Blue Peter*, 1924. He died March 19, 1933.

Thurtell, JOHN (1794-1824). British murderer. Son of a mayor of Norwich, he became a sporting and gambling bully who lived chiefly by his wits. He lost a large sum of money to William Weare, a solicitor of Lyon's Inn (q.v.), whom he shot, hiding the body at a spot now popularly known as Murder Lane, Radlett, Herts, with the aid of two associates, Probert and Hunt. These men turned king's evidence, and Thurtell was tried and found guilty, and hanged at Hertford, Jan. 9, 1824. Consult *The Trial of Thurtell and Hunt*, ed. E. R. Watson, 1920; *Murder at Elstree*, T. Burke, 1934.

Thurtle, ERNEST (b. 1884). British politician. Born of English parents in New York, Nov. 11, 1884, he had an elementary school education, and became an accountant. In 1912 he married Dorothy, a daughter of George Lansbury (q.v.). Having been severely wounded at Cambrai, he took a leading part in the ex-Servicemen's movement, 1919-21. Labour M.P. for Shoreditch 1923-31 and 1935-50, thereafter for Shoreditch and Finsbury, he was for many years secretary of the Rationalist Press Association (q.v.). From 1941 to 1945 he was parliamentary secretary to the ministry of Information. His autobiography, *Time's Winged Chariot*, appeared 1945.

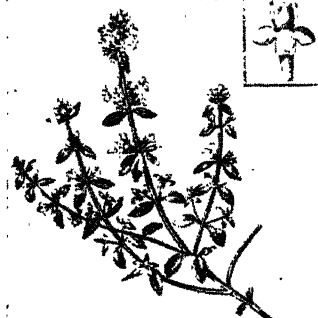
Thyatira. Town of Asia Minor, the seat of one of the seven churches of Asia mentioned in the Apocalypse. It is represented by the modern Ak-Hissar (q.v.).

Thyestes. In Greek mythology, brother of Atreus (q.v.).

Thylacine OR **TASMANIAN WOLF** (*Thylacinus cynocephalus*). Carnivorous pouched mammal, found

in Tasmania. It slightly resembles a wolf; but the fur is close and short, the tail is slender and tapering, and the loins bear black stripes on a greyish brown ground. It lives among clefts of rocks, and is seldom seen in the daytime. Owing to the havoc it works among the sheep, it has been almost exterminated in the more populous districts.

Thyme (*Thymus*). Genus of perennial aromatic plants of the family Labiatae. All the species contain an essential oil, and have very small flowers and leaves. The flowers are generally arranged in whorls, and are purple, reddish, or white. Common thyme (*T. serpyllum*), of procumbent habit.



Thyme. Spray of foliage and flowers of garden thyme. Inset, single flower

grows wild on British hills and in the colder parts of the E. hemisphere. Lemon thyme, so called from its scent, is a variety. Garden thyme (*T. vulgaris*), a plant of taller growth, is a native of the Mediterranean region, and was known in England in 1548. It is used for flavouring. From the flower-heads of several species a stimulant is obtained. Thymol (q.v.) is distilled from the oil. Thyme is easily cultivated in light soil in sunny positions. *Pron.* time.

Thymelaeaceae. A family of herbs, shrubs, and trees, natives of temperate and tropical regions. They have acrid juice and opposite or alternate, undivided leaves. The tubular flowers show no distinction between calyx and corolla, and the fruit is mostly a berry or of plum-like structure. The best known genus is *Daphne*; the order includes *Pimelia* and *Lagetta*.

Thymol. Solid phenol obtained synthetically or from the essential oils of *Thymus vulgaris* (thyme),



Thylacine. Wolf-like mammal of Tasmania, now almost exterminated as a marauder of flocks

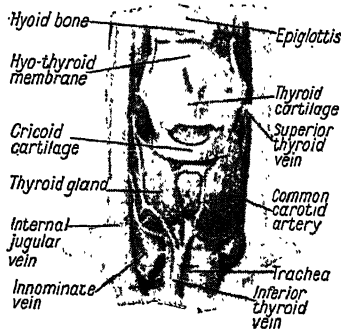
W. S. Derridge, F.Z.S.

Monarda punctata (horsemint), and *Carum copticum* (ajowan). The most economical source is the ajowan plant, the seeds of which yield 3 to 4 p.c. of essential oil, which in turn consists of 30 to 40 p.c. of thymol. The substance forms large colourless translucent crystals. It is used in medicine as an antiseptic and anthelmintic.

Thymus Gland. Ductless gland found in children in the chest cavity lying behind the upper part of the sternum or breast-bone. It reaches its greatest size soon after birth, and from the second year begins to diminish. Its functions are not known. Enlargement may cause death under anaesthetic. See Status Lymphaticus.

Thyratron. Mercury- and gas-filled thermionic valve or relay which works on the same principle as the mercury-arc rectifier. By means of a grid control the thyratron can pass large currents when the grid itself is energised by a small potential.

Thyroid Gland. Ductless gland consisting of two lobes, one on each side of the trachea or windpipe, in the lower part of the front of the neck. The two lobes are connected by a narrow isthmus which stretches across the front of the neck. The function of the thyroid gland is to form an internal secretion which is passed into the sys-



Thyroid gland. Section of the human throat showing position of the gland and adjacent organs

tem and plays an important part in maintaining bodily health; in fact it was long considered the master gland, a rôle now assigned to the pituitary.

Hypothyroidism is reduction of the functions of the gland, such as may follow removal or disease, and produces a condition known as cretinism (*q.v.*) in children, myxoedema (*q.v.*) in adults. Hyperthyroidism is abnormal activity of the thyroid gland and leads to the condition known as exophthalmic goitre (*q.v.*), or Graves' disease. When the whole gland is much enlarged the condition is called goitre (*q.v.*). But the size of a gland is no indication of its functioning, and many people with a goitre are entirely normal, or the complaint may be associated with over- or under-secretion, the enlargement being caused by fibrous tissues strangling the gland tissue.

Thyrus. In Greek religion, the wand wreathed in vine leaves, carried by the god Bacchus and his attendants. *Pron.* Thyrus.

Thysanura (Gr. *thysanos*, fringe; *oura*, tail) OR BRISTLE-TAILS. Most primitive order of insects. It is composed of wingless species living in damp earth, under stones, etc., which undergo no true metamorphosis, the young resembling the adults. Antennae are long and many-jointed; mouthparts are of the biting kind; the abdomen bears traces of minute limbs and ends in long cerci or tail-feelers that are bristle-like. This last feature suggested the popular name. The best known is the silver fish (*Lepisma saccharina*) about $\frac{3}{4}$ -in. long, found in kitchens and cupboards. Its fondness for starches and sugars may cause harm if it is numerous. The related fire-brat (*Thermobia domestica*) occurs in bakehouses. These two species and the shore-inhabiting *Petrobius maritimus* are clothed with scales, and the body bears three tail-bristles. The white, eyeless species of *Campodea* occur in deep earth or decaying wood and are about $\frac{1}{2}$ in. long, including the tail-bristles (two in number). *Japyx*, found in S. Europe and in all continents, has the cerci replaced by a pair of forceps like an earwig. About 20 species of thysanura occur in England. *Consult* Outlines of Entomology, A. D. Imms, 1944.

Thyssen, August (1842-1926). German industrial magnate. Of Hungarian descent, he was born May 17, 1842. He established his first ironworks at Duisburg, and in 1871 founded that at Mülheim-am-

Ruhr which became the nucleus of one of the greatest iron mining and working concerns of Germany. The Deutsche Kaiser mine was a celebrated property of Thyssen's, and he had interests in associated manufacturing and transport concerns. He died April 3, 1926. *Pron.* Teess-en.

Thyssen, August Fritz (b. 1873). German industrial magnate. A leading figure in German iron, steel, and coal industries, he became head of the great Thyssen steel combine. An early supporter of Hitler, he gave large sums to the Nazis, and in 1926 arranged the first lecture given by Hitler to industrialists of Essen. Later he was a member of the Reichstag and of the Prussian state council. He decided to leave Germany after the pact with Russia in 1939, and on the outbreak of the Second Great War fled first to Switzerland, then to the French Riviera. Deprived of German citizenship, he was placed in Dachau concentration camp in 1941. He was classed as a minor offender by a denazification tribunal 1948, 15 p.c. of his property being confiscated. He then went to Argentina.

Tiahuanaco. Ruined city of Bolivia, and centre of Inca culture. It stands on a plain, at an alt. of 12,900 ft., 38 m. W.S.W. of La Paz, near the S. end of Lake Titicaca. The modern town, built from the stones of the ruins, stands nearby. Only a few stones of interest have survived local vandalism. Chief of these is a famous monolithic gateway of trachytic rock, 18 ins. thick, 13 $\frac{1}{2}$ ft. high, and 7 ft. 2 ins. wide. It is believed that the builders were Aymaras of the pre-Inca period. *See* Inca.

Tian Shan, TIEN SHAN, OR THIAN SHAN. Mt. range of Central Asia, otherwise known as the Celestial Mts. Extending about 1,600 m. from S.W. to N.E., and from 100 to 300 m. across, it begins in Kirghiz S.S.R. and runs through the Chinese prov. of Sinkiang into Mongolia. The range forms the N. boundary of the Tarim basin; from its N. side flow the Ili and the Jaxartes or Syrdaria system. Heights of 23,000 ft. are attained. Soviet exploration has brought thousands of sq. m. into use for crops or pasture, and a geophysical station has been set up near Lake Issyk-Kul.

Tiara (Gr., a Persian head-dress). Ornate head-dress of various forms, especially the papal crown. Originally a kind of hat worn by ancient Persian kings, magi, and others, it was worn under the Roman empire by men and women, and became in medieval and modern times a lady's head-band, erect in front. As part of the Byzantine court costume, the tiara was worn by Greek



Tiara. Lower picture, a modern British example. Top, left, two ancient forms of tiara, from reliefs at Persepolis; right, the triple crown worn by the pope

clergy c. 700, when it was called *camelaurum*. It is worn by the pope as a sign of sovereignty, but has no liturgical character. At first a tall, pointed white cap, it was gradually elaborated. A circlet or crown appears on the tiara c. 1100 or earlier, a second crown c. 1200, and a third c. 1305.

Tiaret. Town of Algeria. It is 105 m. by rail E.S.E. of Oran, and is built on the slopes of the Jebel Guezul at an alt. of 3,550 ft., on the site of the Roman city of Tingartia. There are numerous Roman remains and 22 m. distant are the tombs, in the form of pyramids, known as the Jedars.

Tiber (Ital. Tevere). River of central Italy. Called Albula in early times, it is said to have been renamed after Tiberinus, an old king of Alba, who was drowned in its waters, and as a river-god was its patron deity. It rises in the Tuscan Apennines in Forlì prov., on the slopes of Monte Fumajolo, 4,160 ft. above sea level, and flows 245 m., generally S., to the delta on the Tyrrhenian Sea. Its tributaries were called Clanis, Clitumnus, Nar, and Anio. The city of Rome stands on both sides of the river 26 m. from the sea. Here the river

has been canalised for the use of small steamers. The alluvium of its flood waters, which have been the cause of inundations from the earliest times, has given it the name of the "yellow" Tiber. See Rome.

Tiberias. Town of Palestine. the modern Tiberiyah. Founded by Herod Antipas, it was the chief town of ancient Galilee, and long famous for its school of Jewish teachers. It lies on the W. shore of the Sea of Galilee, or Lake Tiberias, sometimes called the Lake of Gennesareth. During the First Great War it was occupied by the British in Sept., 1918. Excavations carried out in the vicinity in 1920 revealed ancient walls and columns believed to mark the site of the old town. Tiberias has a Presbyterian church, and near by are medicinal springs. Pop. 11,810.

Tiberius (42 B.C.-A.D. 37). Roman emperor, A.D. 14-37. Born Nov. 16, 42 B.C., he was the son



Tiberius, Roman Emperor
From a statue in the Vatican

of Tiberius Claudius Nero and Livia Drusilla, whom the emperor Augustus, having forced her to divorce her husband, married in 38 B.C. During the next few years the young prince who stood nearest to Augustus died, and in 2 B.C. he formally adopted his stepson as his heir. Tiberius had seen military service in Spain and acted as governor of Transalpine Gaul. In 12 B.C. he was compelled to marry Julia, daughter of Augustus and widow of Agrippa. In A.D. 13 Tiberius was invested with the tribunitian and proconsular powers, the possession of which gave almost imperial authority; thus, when Augustus died in 14, the succession of Tiberius to the principate was really a foregone conclusion.

Tacitus has presented Tiberius in the most detestable colours, but his conception of the emperor's character was derived from the later years of his reign, in the light of which, and of personal prejudices, he gives an unjust view of its earlier years. Through the greater part of the reign of Augustus, Tiberius had been employed on the ungrateful work of guarding the frontiers on the Rhine and the Danube. He had displayed the highest ability, but his character, naturally harsh and unattractive, had become morose and embittered. He accepted the imperial office with no satisfaction, and discharged it with a conscientious austerity. The provinces were excellently administered. Constitutional forms were strictly observed. Nevertheless, the deaths of popular members of the imperial family were attributed to the jealousy of the emperor, whose superstition, gloom, and melancholy increased year by year.

The only man whom he trusted was Sejanus, the captain of the praetorian guard. In 26 Tiberius retired from the capital to Capri, and Sejanus was entrusted with the exercise of virtually imperial powers, which he used to institute a reign of terror. At length in 31 Tiberius awoke to his treasonable designs and put him to death. But the reign of terror continued. A special treason court had been instituted, and charges of treason were equivalent to condemnation. Tiberius was possessed with a mania of suspicion, and also, though his life until he reached 60 had been ostensibly austere, with a passion for debauchery. Hideous tales, probably exaggerated, were told of foul doings on Capri where

Tiberius lived in growing seclusion; until at last the nightmare was dispelled by the murder of the emperor in 37.

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Tiberius. East Roman emperor, 578-82. Born in Thrace, he became commander of the palace guards of Justin II (q.v.).

Tibesti. Region of the Sahara. Lying about 360 m. N.E. of Lake Chad, on the Libyan border, it is largely mountainous, with summits reaching 8,000 ft. There are heavy occasional rains. In 1914 a French column occupied the country.

Tibet. Semi-independent Central Asian state. More than eight times the size of Great Britain, it occupies a region between India and China in which is the most enormous and the highest mass of mts. in the world—hence Tibet's popular name, the roof of the world. It has an area of about 470,000 sq. m.; its greatest length is 900 m.; its width varies from 250 m. to 600 m. Pop. 3,722,011.

The higher region is poorly drained, and a large part of it is occupied by lakes; the soil here is frozen solid for eight months of the year, and during the other four is mud. There is scarcely any vegetation, and few signs of life. Even in summer the noon temp. is seldom less than 16° below freezing point. The mean alt. of this part of Tibet is 16,500 ft. In the central region (mean alt. 15,000 ft.) a few animals feed scantily upon grudging pastures, but there is very little cultivation.

The S. zone is fairly fertile and well watered, and suitable for



Tibet. Map of the Central Asian state which separates India from China, and was for many centuries a land of mystery closed to all foreigners

growing varied crops, even rice and apricots; owing to its nearness to the equator these crops can be raised in valleys 11,500 ft. high. Here also there is a good deal of timber. But as a whole Tibet is a harsh and sterile country, where it is difficult to make a living off the soil. Rivers which rise in Tibet include the Brahmaputra, the Suttlej, and the Indus.

The people, of Turco-Mongol origin, are in general short of stature, spare in figure, with high, narrow forehead, prominent nose, large ears, thin features, high cheek-bones, light-brown eyes less almond-shaped than those of the Chinese, black hair, and slightly reddish skins.

Sheep and yaks are bred, the latter being crossed with other cattle and used both as beasts of burden and for food. Buffaloes, camels, and pigs are also bred. There are scarcely any manufactures. Commerce with China is considerable, and there is a trade with India.

Chief imports are tea and tobacco, cotton and silk goods, sugar, rice, household requisites, and articles of luxury; these go for the most part to the monasteries, in which dwell an enormous number of Buddhist monks.

The dress worn by men of all classes is a wide and very long gown, gathered up during the day so that it does not reach below the ankles of the leisured or literary class or the knees of the labouring folk. Women wear the same kind of gown, reaching to their ankles; in some districts they dress their hair elaborately and wear jewels in it, in others they plait it and let it hang down their backs.

The custom which ordained that a wife should be equally the property of her husband and his brothers is on the wane; but conjugal fidelity is not expected. Neither women nor men, except in the highest rank, take much care of their persons; they wash seldom, and their habit of covering their faces and hands with rancid butter is offensive.

Men follow their fathers' callings. The nobility own land and have the right to tax, to administer justice, and to requisition labour. The pariahs at the bottom of the social scale are butchers, undertakers, etc.; above them come the serfs, of whom there are a great many, in practice bound to the soil, though by legal fiction free. There are a few small farmers and traders. The whole



Tibet. 1. Fashionable lady from the south of the country. 2. A peasant. 3. Two women from the Mongolian frontier in full dress

By courtesy of the American Museum of Natural History

of Tibetan lay society is dominated by a monastic hierarchy possessed of great wealth. The form of Buddhism practised is mechanical and materialistic. Praying wheels are in common use, the wildest superstitions flourish; the dead are cut up and thrown to beasts and birds of prey. Magic is practised in its most primitive forms.

Lamaism has prevailed in Tibet since the 8th century. Since 1270 the temporal power has been in the hands of the Dalai Lama, who is head of the church, or a regent during his minority. During the 17th cent. the Chinese established an ascendancy maintained in some degree until the revolution of 1912. In the 18th cent. friendly negotiations were carried on between the Dalai Lama and the British East India co., but were broken off when in 1792 a British general helped Nepalese (Gurkha) invaders. Then the Tibetans closed their frontiers against all foreigners for more than a hundred

years. In 1904 F. E. Younghusband (*q.v.*) penetrated to Lhasa, the capital, and secured a convention. Attempts by the Chinese republic to reassert Chinese authority by force were vigorously resisted by Tibet, but from 1939 a representative of the republic was permitted to reside in Lhasa. A Canadian anthropological expedition under William Dunning, which spent three months in Tibet in 1947, filmed Tibetan manners and customs. A Tibetan trade mission, the first of its kind, toured Great Britain and the U.S.A. during Aug., 1948. See Dalai Lama; Lamaism; Lhasa.

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Tibia or SHIN-BONE. The inner and larger of the two bones of the lower leg. It is attached by ligaments to the fibula at its upper and lower ends. Above, the tibia articulates with the femur to form the knee-joint, and below with the foot, forming the ankle-joint. The prominence of the lower end, which can be felt on the inside of the foot, is known as the internal malleolus. Owing to the closeness of the bone to the skin in front, fractures of the tibia are frequently "compound," i.e. the skin is injured and a communication established between the fracture and the external air. See Leg.

Tibullus, ALBIUS (53–18 B.C.). Roman poet. A member of the equestrian order, he served under Messalla in Gaul and Coreyra, and then retired to Rome, where he devoted himself to literary pursuits. Four books of his Elegies are extant, all distinguished by a fastidious delicacy of mind and by a depth of pure emotion perceptible beneath singularly limpid and smoothly flowing verse.

Tic Douloureux. Severe form of neuralgia affecting the side of the face. See Neuralgia; Trigeminal Nerve.

Tichborne Case. In English law, a celebrated impersonation case. Roger Charles Tichborne (1829–54), heir to an ancient Hampshire baronetcy, sailed for Valparaiso in March, 1853. He wrote home constantly until April 20, 1854, when he sailed from Rio de Janeiro for Jamaica in the

Bella, which never reached its destination. From that date he was never seen or heard of again. In 1865, in response to world-wide advertisements issued by the dowager Lady Tichborne, "R. C. Tichborne" turned up at Wagga Wagga, Australia, in the person of an impecunious butcher, locally known as Tom Castro.

At Sydney he put on record that he was wrecked in the Bella and picked up by the Osprey, bound for Melbourne, and on Christmas Day, 1866, the claimant landed in England. Roger's mother professed to recognize him, as did several others. He became popularly regarded as the rightful heir, and bonds were issued to provide money for his claim, but his story contained too many discrepancies. Finally Castro was identified as Arthur Orton, the son of a Wapping butcher. His claim was nonsuited, March 6, 1872, after a cross-examination lasting twenty-two days by the solicitor-general, afterwards Lord Coleridge (*q.v.*).

After the longest criminal trial (April, 1873, to Feb., 1874) in British annals, presided over by Chief Justice Cockburn, Orton was sentenced, on two counts of perjury, to fourteen years' hard labour. Released on ticket-of-leave, 1884, he published a confession in a Sunday newspaper in 1895, which he subsequently recanted. He died in London in April, 1898. The defence of the family alone against the claim in this remarkable case cost more than £90,000. Consult *The Tichborne Case*, Lord Maugham, 1936.

Ticino (anc. Ticinus). River of S. Switzerland and N. Italy. It rises in two headstreams on Mt. St. Gotthard, flows S.E. and then S.W. through the canton of Ticino and Lake Maggiore; it then divides Piedmont from Lombardy and effects a junction with the Po a little below Pavia. It is 154 m. long and is navigable S. of Lake Maggiore. The chief towns on its banks are Pavia and Bellinzona. Hannibal inaugurated his campaign in Italy by defeating the Romans on its banks in 218 B.C.

Ticino (Fr. and Ger. Tessin). Canton of S. Switzerland. It is bounded N. and E. by Grisons, S. by Lombardy, and S.W. by Piedmont. Named from the river Ticino, it contains the upper part of Lake Maggiore and the larger part of Lake Lugano. On the S. slopes of the Alps, the lower parts are Italian in scenery, climate, etc., and the people are Italian in speech and mainly Roman Catho-

lic. Cattle breeding and dairy farming are the chief industries in the N.; in the S. oil and wine are produced and fruit and cereals grown. Bellinzona is the capital, and other places are Locarno, Lugano, and Chiasso. Ticino became a member of the Swiss confederation in 1803. Its area is 1,086 sq. m. Pop. 161,882.

Tick. Name given to certain members of the class Arachnida (*q.v.*), allied to the mites and



Tick. Left, dog or sheep tick; right, tick larva. Both highly magnified

grouped with the latter to form the order Acarina. They are blood-sucking parasites that attach themselves by means of a piercing rostrum to the skin of man and domestic or wild animals. The females swell greatly after a blood meal and, in many species, are of great importance in transmitting protozoan or other disease organisms. These are often transferred through the eggs to the progeny of the tick. Larvae of many ticks live among herbage, attaching themselves to passing animals. Some species live on a single host individual; but others require two or three hosts, and a single tick may sometimes transmit disease to each host. Among tick-borne diseases are Texas or red-water fever in cattle; piroplasmosis in horses and dogs; relapsing fever in man and animals; and tick-paralysis.

Tickell, THOMAS (1686-1740). English poet. Born near Carlisle and educated at Queen's College, Oxford, of which he became a fellow, he obtained several political appointments through the influence of his great friend Addison. His translation of the first book of Homer's *Iliad* appeared about the same time as Pope's, and Addison, with justice, praised it as the best, thereby offending Pope, who retorted by making Addison the subject of a satire. Nothing else that Tickell wrote is of particular in-

terest except the elegy lamenting Addison's death which he prefixed to his edition of Addison's works. He died at Bath, April 23, 1740.

Ticket Day. Term used on the London stock exchange to denote the day before settlement day or pay day of each fortnightly account. It is also called name day. On this day the broker of a client who has bought securities must pass to the jobber who has sold them the name and description of the buyer. If the jobber has sold from his own trading stock, he keeps the ticket; if not, he passes it to the broker of the client who has sold the stock. Sometimes a jobber sells in one transaction stock that he has bought in two or more transactions; in that case the ticket is said to be divided or split, *i.e.* the jobber makes out fresh tickets to a total value equal to that of the ticket received from the buying broker. On the day after ticket day, *i.e.* on pay day or settlement day, the transfer deeds are presented to the buyer's broker, who then pays for the securities that his client has bought, having previously received a cheque from his client in payment of the amount of the contract note sent to him when the bargain was made with the jobber. See *Stock Exchange*.

Ticket-of-Leave. In English law, name applied to a type of licence to be at large formerly granted to convicts. Granted upon certain conditions, it might be revoked for any infringement.

Ticket-of-Leave Man, THE. Drama founded by Tom Taylor on Le Retour de Melun, of MM. Brisebarre and Nuz. It was produced, May 27, 1863, at the Olympic Theatre, London, where it ran for 406 performances. The story is concerned with the troubles of a wrongfully convicted ticket-of-leave man who, unable to get employment, is tempted to become an habitual criminal. Hawkshaw, one of the chief characters and one of the first stage detectives, is remembered for his astuteness of disguise and dramatic revelation of identity with the words, "It is I—Hawkshaw, the detective!"

Tickhill. Town and parish of the W. Riding of Yorks, England. Situated on the Notts border, 6 m. S. of Doncaster, it has a large Early Perpendicular church of S. Mary, built about 1360, containing old tombs and some 14th century stained glass. There are also an old almshouse, the remains of a hospital of S. Leonard, founded about 1225, the ruins of an Augustinian



Thomas Tickell,
English poet
After S. Harding

priory, founded by Queen Eleanor, and a ruined Norman castle. Pop. est. 2,250.

Ticking (Lat. *theca*, case). Strong twilled linen or cotton cloth, often white with blue or pink stripes. It is used for mattresses, tents, and awnings, and sometimes as a ground for embroidery.

Ticknor, GEORGE (1791–1871). American literary historian. Born at Boston, Mass., Aug. 1, 1791, he



George Ticknor,
American historian

graduated at Dartmouth in 1807, and in 1815 went to Europe, visiting most of the capitals and studying at Göttingen. From 1819 to 1835 he was professor of

belles-lettres and of French and Spanish at Harvard. The next three years he spent in Europe, and in 1849 he published his magnum opus, *The History of Spanish Literature*, the fourth edition of which (1872) contains his last revisions. Further visits to Europe followed, and in 1864 he published his *Life of Prescott*. Ticknor helped to establish Boston public library in 1852, was one of its trustees until 1866, and its president in 1865, and bequeathed to it his library, which was particularly rich in Spanish and Portuguese authors. He died Jan. 26, 1871. *Consult* *Life, Letters, and Journals*, ed. G. S. Hillard, repr. 1909.

Ticknor, WILLIAM DAVIS (1810–64). American publisher. In 1832 he secured a partnership in the firm of Allen and Ticknor, at Boston, and developed the business with other partners, changing the name of the firm to Ticknor and Fields in 1854. They published *The North American Review* and *The Atlantic Monthly*, and their shop, the Old Corner Book Store, was long a resort of the literary men of the period.

Ticonderoga. Village of the U.S.A., in New York state. Situated at the N. end of Lake George, about 100 m. N. of Albany, its position on the waterway between Canada and the sea gave it strategic importance. Here in 1755 the French built a fort, called at first Fort Carillon, in allusion to the sound made by the waterfalls, and afterwards by the Indian name *Ticonderoga*. Attacked in 1758 by the British, who lost heavily, it was abandoned a few days later. Stevenson's ballad, *Ticonderoga*, alludes to this battle in

connexion with the story of the Appin Murder (*q.v.*). During the War of American Independence the place changed hands a number of times, and with the end of this struggle it fell into decay. The village manufactures paper, and graphite is found in immense quantities in the neighbourhood. Pop. 3,402.

Tic-Tac. Method of signalling in use on racecourses. Its chief object is to communicate the betting movements in Tattersall's to bookmakers in the smaller rings and on the course itself when outside betting is permitted.

The tic-tac is operated in a triangular manner, the betting movements in Tattersall's being communicated by one of the operators to a second stationed on the grand stand, who passes on the message to a third person, who, in turn, communicates the information to the bookmaker for whom he works.

The signs are made by touching various parts of the head, arms, and body, and although more or less universally used, are varied at times to deceive outsiders by introducing what is colloquially called the "twist," i.e., the signs are made the reverse way and the numbers assigned to horses on the race cards are reversed or otherwise altered. Customarily the signs used run from the right shoulder, over to the left shoulder, and up either arm, a few of them being as follows: One, right shoulder touched with right hand; two, right ear with right hand; three, right side top of head with right hand; six, left shoulder with left hand; ten, both hands placed together; 7 to 4 against, tips of left hand fingers with right hand; 5 to 2 against, breast pocket with right hand.

Tidal Power. Power available from the flow and ebb of the sea tides. The problem of harnessing it is in many respects related to that of harnessing flowing inland water. For many years engineers have been considering ways and means of utilising tidal power successfully; tide mills were, in fact, in operation at the beginning of the 19th century. The general principle is to construct a barrage across an estuary in such a manner that water flows into an enclosed area through openings, which are closed at high tide. When the tide falls, the difference in level between the impounded water and the sea below the barrage is utilised to drive turbines. This is known as single tide working; double tide working

implies the development of power by the rising as well as the falling tide. Allowance must be made for the variation of power output due to the fall of the tide twice a day and the advance by one hour daily of the time of high tide.

A large rise and fall of tide, and a suitable impounding area, provide the best conditions for a tidal power scheme, and special attention has been devoted to the practicability of harnessing the power of the river Severn (*q.v.*).

Tide. Rhythmic rise and fall of the oceanic waters. The movement is most marked on shores which shelve gradually. The average interval between successive high tides is 12 hrs. 25 mins., half the time between successive passages of the moon across a given meridian. The height of the tide varies rhythmically; highest, or spring, tides gradually change to the lowest, or neap, tides. The interval between successive spring tides is half a lunar month. Usually spring tides occur at or near the time when the moon is new or full, and neap tides when the moon is in the first or third quarter. These facts suggest that the moon is the main cause of the tide.

The mass of the moon attracts the oceanic waters, which, being fluid, make a little peak pointing directly from the earth's centre to the centre of the moon; this peak is held on the line of centres while the earth rotates beneath it. To observers on the earth the peak of water appears to move. At the antipodes of this peak, on the side of the earth remote from the moon, a second peak occurs, because the distant water is again attracted to the line of centres. These peaks are the successive high tides.

Lunar attraction is coupled with a similar attraction due to the sun, but only of four-ninths the magnitude. When the line of centres of the earth and moon approximates to the line of centres of the earth and sun, i.e. at full and new moon, the combined solar and lunar tides produce the spring tides. When the two lines of centres are at right angles, at the first and third quarters, the solar attraction reduces the lunar effect and produces the neap tides. The neap tides are, on the average, 5 : 13, i.e. $(9 - 4) : (9 + 4)$, of the spring tides.

This theoretical explanation of the outstanding tidal features merely details the phenomena as they would occur upon an earth with a film of ocean surrounding it. The interposition of the great

land masser, and the differences in the oceanic depths, cause variations in the tides along the coasts. When, for instance, it is high tide at noon at Liverpool, the preceding high tide has almost reached Peterhead.

At Ayr the spring tide rises 8 ft., at Greenock 10 ft., and at Glasgow 13 ft.; at Swansea it is 27 ft. and at Cardiff 36 ft., Bristol 33 ft., Newport and Chepstow 38 ft.

In the centres of the seas and in the open oceans it is not possible to detect the tidal movement except on the shores of oceanic islands, where a rise and fall of a few feet usually occurs. In the Mediterranean the range is about one ft.

High tide at any port occurs within a few minutes of a stated time interval after the moon crosses the meridian. The average interval, which differs at each port, is known as the establishment of the port; at London Bridge it is 1 hr. 58 mins.

The magnitude of the observed tide at a place may differ from the astronomical or predicted tide, the difference depending on the wind and atmospheric pressure. If this difference is such as to increase the effect, at or near high tide, coastal defences may be endangered. The disastrous floods of Jan. 6-7, 1928, in the Thames (*q.v.*) valley were attributed to previous heavy rain and melting snow followed by an abnormally high tide caused by a strong pressure gradient and an associated northerly gale over the North Sea.

Tidal effects, due to the moon, have been observed in the atmosphere. Records of barometric pressure at ground level at certain meteorological stations show two maxima and two minima in each lunar day, the amplitude of the waves being greatest in the tropics. In 1938 a series of radio measurements of the variations in height of the Heaviside layer (*q.v.*) at Cambridge revealed a lunar semi-diurnal oscillation of height.

Tidesman OR TIDE-WAITER. Custom house officer. The name was given to one who watched the landing of goods and secured the payment of duties. *See* Customs.

Tideswell. Market town of Derbyshire, England. In the Peak district, it is 8 m. E.N.E. of Buxton. The chief building is the church of S. John the Baptist, a beautiful example of 14th century architecture, its tower being especially noteworthy. In the vicinity are lead mines, and near the town are Miller's Dale and other beauty

spots. Market day, Wed. Pop. approx. 2,000.

Tidikelt. Most southerly of the Algerian oases, E. of Tuat (*q.v.*), and containing the oases of Akabli, Aoulef, Tit, and In Salah (Ain Salah). The last is the chief town and about equidistant from Timbuktu, Mogador, Tangier, Algiers, and Tripoli. Tidikelt contains about 300,000 date palms. It was occupied by France in 1902.

Tidworth. Village and parish of Wilts, England. On the Hants border, 9 m. W. of Andover, it is on a branch rly. from Ludgershall. Tidworth camp is the headquarters of the southern command, and the principal training area of the Royal Armoured Corps. Both the Park and the Pennings have been used for training infantry, cavalry, and artillery. The tower of Holy Trinity church dates from 1360. Pop. 4,358.

Tieck, JOHANN LUDWIG (1773-1853). German critic, poet, and novelist. He was born in Berlin,



J. L. Tieck,
German critic

May 31, 1773, and studied at Halle, Göttingen, and Erlangen. In 1799 he joined the literary circle at Jena, where he became one of the leaders of the Romantic movement. He visited Italy in 1805, England and France in 1817, and in 1825 became director of the court theatre at Dresden. In 1841 he removed to Berlin and there died, April 28, 1853.

Tieck produced many volumes of fanciful fiction and valuable compilations, criticisms, and translations. Following three youthful novels, Peter Lebrechts Volksmärchen (Fairy Tales of Peter Lebrecht), 1797, was his earliest work of notable distinction; it was later revised and issued as Phantasia, 1812-17, five of the tales being translated by Carlyle. Early poetic plays, Genoveva, and Kaiser Octavianus, 1804, perhaps represent the best of Tieck's original work. He made a valuable collection of ancient poetry in Minnelieder aus dem Schwäbischen Zeitalter (Minstrelsy of the Swabian Era), 1803. A series of translations, Altenglisches Theater (Old English Plays), 1811, was followed by a similar collection of old German plays. He assisted Schlegel with his translation of Shakespeare's plays, wrote a novel on Shakespeare's life, Dichterleben, and a series of essays on the same

poet in Shakespeares Vorschule (Introduction to Shakespeare), 1823-29. *Consult* Collected Works, 28 vols., 1828-54; Critical Essays, T. Carlyle, 1840; L. Tieck in Dresden, A. Stern, 1879; L. T. and England, E. H. Zeydel, 1931.

Tied House. Public house or inn of which the licensee, by the terms of a contract (usually a mortgage) entered into with some brewery, or because the house belongs to brewery, may sell beer made by that brewery only.

Tiel. Town of the Netherlands, in the prov. of Gelderland. It lies on the right bank of the Waal, 19 m. S.E. of Utrecht, on the Nijmegen-Rotterdam rly. line. Industries are concerned with tobacco, fruit preserving, and agricultural implements, and there is trade in grain, cheese, and livestock. Tiel had a charter in the late 10th century, was sacked by the Normans, 1006, and held by the insurgent Dutch from 1579. The Kleiberg Gate is part of the old fortifications which defended the town. Tiel was in German occupation from May, 1940, until the end of the Second Great War. Pop. 12,370.

Tientsin. Former treaty port of China, in Hopei prov. Its name meaning the ford of heaven, it is situated at the junction of the Pei-ho and the Grand Canal about 70 m. from the sea and 70 m. S.E. from Peking. Railways connect it with Peking, Manchuria, the Kaiping coal mines, Hankow, and Pukow. The river is frozen from Nov. to April, yet the port receives most of the goods destined for Peking, has a great trade in salt, and is the point of departure of the tea caravans for Siberia and Russia.

The Chinese city is small. Formerly it was surrounded by walls 4 m. in circuit; these were razed after the Boxer Rising. It was opened to foreign trade in 1860. It is insalubrious, in striking contrast to the foreign city, 1½ m. downstream, with its fine buildings, and streets. Here the foreign pop. of some 2,500, and many Chinese merchants and business men, live under the government of an elected all-Chinese municipal council. Foreign concessions were accorded to Great Britain in 1860, France 1861, Germany 1895, Japan 1896, Russia 1900, Italy 1901, Austria-Hungary and Belgium 1902. The foreign city suffered severely at the hands of the Boxers (*q.v.*) in 1900. The Japanese bombed Tientsin from the air on July 29, 1937, destroy-

ing the university. The town was captured by Chinese communists Jan. 15, 1949. Pop. 1,718,000. See Treaty Port.

Tiepolo, GIANBATTISTA (1696-1770). An Italian painter, born April 16, 1696, in Venice. He studied under Gregorio Lazzarini, but his work appears to have been influenced more by Titian and Veronese. He began his career in Venice, where are the bulk of his frescoes and oil paintings; one may cite his Antony and Cleopatra series in the Palazzo Labia. During 1750-53 he was at Würzburg, employed with his sons on the decoration of the archbishop's palace; he worked also at Bergamo and Madrid, where, on March 27, 1770, he died. The National Gallery, London, has two of his altarpiece designs. *Pron.* Tee-epp-olo.

Tierce (Lat. *tertius*, third). In fencing (*q.v.*), the third position of the wrist. The word is also used for a cask containing 42 gallons, and for a sequence of three cards of the same suit. Ecclesiastically it is the third hour of the day and its office.

Tierney, GEORGE (1761-1830). British politician. Born at Gibraltar, March 20, 1761, of Irish stock,



George Tierney,
British politician

he was educated at Eton and Peterhouse, Cambridge, and was called to the bar. In 1789 he entered parliament for Colchester, and with a short interval he remained therein until his death. A prominent Whig, Tierney in 1803 became treasurer of the navy, thus breaking for a time with his party. In 1806 he was president of the board of control for a few months. Leader of the opposition from 1817, after ten years he became master of the mint. He died on Jan. 25, 1830. Tierney is best remembered for his bloodless duel with William Pitt on Putney Heath, May 27, 1798. A Life by H. K. Olphim was published 1934.

Tierra del Fuego (Sp., Land of Fire). Island at the S. extremity of S. America. Forming part of the Tierra del Fuego archipelago, it was discovered by Magellan in 1520 and is divided between Chile and Argentina. The coasts are deeply indented and the surface mountainous, culminating in the twin peaks of Darwin (6,800 ft.) and Sarmiento (7,200 ft.). The mountains are generally snow-capped or covered with stunted vegetation.

Chief industries are timber cutting, sheep raising, and seal fishing. The capital of the Chilean portion is Punta Arenas or Magallanes (*q.v.*), most southerly town in the world; that of the Argentine territory, which has only 4,921 inhabitants in 8,344 sq. m., is Ushuaia on Beagle Channel. The original Fuegians now number scarcely 1,000. See Staten Island.

Tietjens or **TITTENS**, TERESA CAROLINA JOHANNA (1831-77). German operatic singer.



Madame Tietjens,
German singer

Born of a Hungarian family at Hamburg, July 17, 1831, she made her first appearance on the stage there, 1849, and by 1856 had become one of the foremost singers of her time.

Her mezzo-soprano voice and dramatic powers made her widely famous, among her best parts being Fidelio, Norma, Valentine, and Medea. Her success in Les Huguenots on her first London appearance, 1858, led her to make England her home. She died Oct. 3, 1877.

Tiffin. Word applied originally among Anglo-Indians to a light repast between breakfast and dinner. It is derived from tiff, a North Country dialect word meaning a small draught of liquor.

Tiffin. City of Ohio, U.S.A., the co. seat of Seneca co. It stands on the river Sandusky, 42 m. S.E. of Toledo, and is served by the Baltimore and Ohio and other rlys. It is the seat of Heidelberg university. Industries include the manufacture of iron goods, glass, pottery, woollen goods, and gloves. Settled in 1817, Tiffin was incorporated in 1835, being named after its first governor, and became a city in 1850. Pop. 16,102.

Tiflis. Historic name of Tbilisi (*q.v.*), capital of Georgia S.S.R.

Tigellinus, SOPHONTUS (d. A.D. 69). Favourite of the emperor Nero. A Sicilian of infamous character, he became prefect of the praetorian guards, and kept his position by pandering to Nero's vices and making himself the instrument of tyranny. Hated by the people, he was suspected of complicity in the burning of Rome. He deserted Nero on the eve of his fall, and was compelled to commit suicide on the accession of Otho.

Tiger (*Felis tigris*). Large carnivorous mammal, belonging to the

cat family. It is the largest of the cats, with the exception of the lion, and a fine male specimen will measure about six feet from the tip of the nose to the root of the tail, which is about three feet long. The female is about a foot shorter. The colour of the fur is a reddish fawn on the upper parts, with white under parts, and white markings on the face and ears. The transverse stripes on the body are black, but vary considerably in number and form. White and black animals have been found very rarely. The hair is short in Indian specimens, but long and woolly in the Siberian or Manchurian variety. In Malaya occurs a variety smaller in size, and so heavily striped as to appear considerably darker in colour.

The tiger is found throughout most parts of Central and S. Asia, from the Caucasus to Sakhalin. It occurs in most parts of the Indian sub-continent, but not in Ceylon. Its favourite haunts are jungles and forests, where its striped coat blends with the high-standing yellow grass, making it difficult to detect. The tiger keeps to its lair during the day, and preys at night upon cattle, deer, and other animals. It usually avoids man, and will make off if approached during the day, but if it once makes the discovery that natives are more easily caught than deer, it becomes a dangerous pest.

The tiger is solitary in its habits, though occasionally family parties consisting of the parents and their grown-up offspring occur. It consorts in the breeding season with only one female, and from two to five cubs are born in a litter. They become adult at three years; until that time they usually keep with their parents.

Tiger Beetle (*Cicindelidae*).

Extensive family of carnivorous beetles. Natives chiefly of the



Tiger Beetle. British green species, natural size

warmer regions, they include few British species; best-known of these is the green tiger (*Cicindela campestris*), which flies freely in sunshine over heaths in late spring. Coloured green and blue, with the long, thin legs a shining copper colour, it sparkles conspicuously as it preys on other insects. As a larva it is equally rapacious, already possessing the keen sickle-



shaped jaws that are so noticeable in the beetle. The larva inhabits a shaft in the ground.

Tiger Cat. Name vaguely applied to numerous species of wild cats. One, *Felis celandogaster*, is found in equatorial Africa, and is remarkable for the fact that the colour of its coat varies at different ages. In Central and S. America occur several species of arboreal cats which go by this name, notably *F. tigrina*, which is grey with black spots. See Margay.

Tiger Lily (*Lilium tigrinum*). Bulbous herb of the family Liliaceae. A native of China, it is much cultivated in Great Britain. It grows to a height of about 3 ft., and in late summer bears racemes of orange-red flowers spotted with purplish black. See Lily.

Tiger Moth. Brightly coloured moth of the family Arctiidae, of which there are six British species. The commonest is the garden tiger (*Arctia caia*), whose densely hairy caterpillar is popularly called a woolly bear.

Tiger's Eye. Natural stone, sometimes cut and polished on account of a deep golden-brown colour, due to alteration and silicification of crocidolite asbestos.

Tights or FLESHINGS. Skin-tight garments worn on the stage by acrobats, etc. Those of the acrobat, with their puffed breeches, correspond to the Florentine trunk hose of the early 16th century, just as the conventional figure of Punch owes his pease-cod-bellied doublet to the same century. See Costume.

Tiglath-pileser. The name of several Assyrian kings. The first, reigning c. 1100 B.C., extended Assyrian power into Armenia, Cappadocia, and Lebanon and rebuilt Asshur.



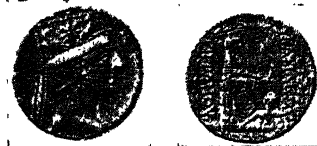
Tiglath-pileser III, from a bas-relief at Nimroud



Tiger. Full-grown male specimen of the powerful Indian variety. Top, the woolly-haired Siberian tiger. See opposite page

Tiglath-pileser III or IV (c. 745-727 B.C.), also called Pul (2 Kings 15), reorganized the army and the state, and subdued N. Syria, holding a court at Damascus attended by Ahaz of Jerusalem (2 Kings 16). His conquests ranged from Ararat to Elam, and in 729 he took Babylon. See Menahem.

Tigranes. Name of several kings of ancient Armenia. Tigranes the Great (121-55 B.C.),



Tigranes. Obverse and reverse of a coin of Tigranes the Great, the former bearing his likeness

variously ranked as I or II, spent many years in Parthia as a hostage. Purchasing release by restoring Parthian territory annexed by Armenia, he succeeded his father Artavasdes II in 95. Aided by his father-in-law, Mithradates the Great, king of Pontus, he regained the ceded lands, turned Syria and Phoenicia into a satrapy, and ruled W. Asia from Pamphylia to the Caspian, founding a new capital at Tigranocerta in the upper Mesopotamian plains. His reception of

Mithradates as a refugee aroused Roman enmity. In 69 Lucullus defeated him at Tigranocerta, and next year at the old capital Artaxata. In 66 Pompey inaugurated a campaign which resulted in the final subjugation of Tigranes, but on payment of 6,000 talents he was left in possession of Armenia Major until his death.



Tigré. Province of Abyssinia. Situated in the N. of the country, it was formerly an independent kingdom. The Tigré language is spoken also in Eritrea. Adowa (q.v.) is the capital of the prov.

Tigre, EL. Argentine watering-place in the prov. of Buenos Aires, much frequented by residents of the capital city, which is 17 m. distant. The township consists chiefly of quintas, or summer residences, and has hotels and boating clubs. It occupies an island formed by the streams of the Tigre and the Luján. Much fruit is grown in the district.

Tigridia. Small genus of bulbous plants, of the family Iridaceae, natives of Mexico and Central



Tigridia. Grass-like leaves and bloom of *T. pavonia*, the Tiger flower

America. *T. pavonia* was introduced into Great Britain in 1796; the plants are about 18 ins. in height, and the flowers are yellow, red, or violet. Tigridias flourish in

a cool greenhouse in sandy loam, but are not extensively grown, as the flowers last at their best only two days. In S. and W. England the tiger flower, as it is called, is hardy out of doors in a warm shady bed or border, but the bulbs should be lifted and stored in autumn, after flowering, in the same manner as dahlias and gladioli.

Tigris. River of Turkey and Iraq. It is formed by the union of several streams which come down from the mts. of Turkish Armenia and the Azerbaijan prov. of Persia. Upwards of 1,100 m. in length, it flows in a S.S.E. direction across Iraq to the Shatt-el-Arab, near Kurna. Its chief tributaries, the Great Zab, the Lesser Zab, and the Diala, join it from the E. Called by the modern Arabs Digla, the Tigris is the Hiddekel of Gen. 2, v. 14 and Dan. 10, v. 4. Several famous cities of antiquity stood on or near its banks. In the First Great War the Tigris played a prominent part in the fortunes of the Mesopotamia expedition. At the time of the British operations the navigability of the channel was vastly improved, steamers of some size being able to ascend as high up as Bagdad, and Basra being turned into an ocean port. *See* Amara; Bagdad; Euphrates; Iraq; Mosul; Nineveh.

Tikhvin. Town of R.S.F.S.R. It is in the region, and 110 m. N.E., of Novgorod, on the Tikhvinka, a trib. of the Syas. It gives its name to a type of river barge. On the rly. from Leningrad to Vyatka, it was held by the Germans Nov. 11-Dec. 8, 1941, isolating Leningrad. Pop. est. 14,000. *See* Leningrad, Siege of.

Tilburg. Town of the Netherlands, in the prov. of N. Brabant. It lies 13½ m. by rly. E. of Breda, being a busy junction. The town has woollen, bootmaking and tanning, and tobacco industries. Here is an R.C. commercial high school. In German occupation from May, 1940, Tilburg was entered by British tanks Oct. 27, 1944, after the Germans had left. Pop. 113,090.

Tilbury. Town of Essex, England, part of the urban dist. of Thurrock. On the N. bank of the Thames, Tilbury is 23 m. by rly. E. of London. E. Tilbury is 1½ m. S.E. and W. Tilbury ¾ m. W. of the station. W. Tilbury was a Roman fortress defending the Thames approaches, and in 1588 was the site of the camp for troops assembled to repel the threatened Spanish invasion. E. Tilbury was a town early in the 15th cent., when the present Tilbury Fort was built. Pop. approx. 20,000.

Tilbury docks are one of the five systems under the jurisdiction of the port of London authority. There are a main dock and three branch docks, with water frontage of over 3 m. A floating passenger landing stage, 1,142 ft. long, can accommodate the largest liners at any state of the tide. Among steamship lines sailing from here are P. & O., Orient, City, and Clan. Slightly damaged by German bombs in the Second Great War, the docks were one of the embarkation points for the Allied invasion of Europe 1944. Tilbury is connected with Gravesend by ferry.

Tilden, SAMUEL JONES (1814-86). American lawyer and statesman. Born at New Lebanon, N.Y., Feb. 9, 1814, and educated at Yale and New York universities, he was called to the bar in 1841. Mainly instrumental in breaking up the Tammany or Tweed financial ring, he was elected governor of his native state in 1874. At the presidential election in 1876, in which he was Democratic candidate, a dispute arose as to the legality of the votes of La., S.C., and Fla. A commission of investigation gave Rutherford Hayes the election by one vote. Tilden retired from public life and died at Greystone, N.Y., Aug. 4, 1886. John Bigelow wrote his Life, 1895.

Tilden, WILLIAM TATEM (b. 1893). American lawn tennis player. Born Feb. 10, 1893, at Germantown, Pa., he was one of the finest singles players his country ever produced, representing it in every Davis Cup final during 1920-30. He held the American singles title from 1920 to 1925 and in 1929; his Wimbledon record showed victories in 1920, 1921, and 1930. He later turned professional. In 1949, while in prison for violating probation terms imposed on a moral charge two years earlier, he received a further term for contributing to the delinquency of a minor.

Tile. Unit of burnt clay, fine concrete, glass, asbestos-cement, copper, etc. Tiles are made for roofing, for floor paving, and for wall lining, and to a small extent certain tiles are used for covering ceilings. Most tile units are small, but large units are made in asbestos-cement, glass, and metals.

ROOFING TILES. Burnt clay is processed, pressed in moulds of suitable shape, and then burnt in kilns to produce hard, durable tiles. They are slightly absorbent, and roofs covered with them, to be weatherproof, must be so constructed that rainwater runs

off before it can soak through the tiles. Some tiles are sand-faced to produce an interesting texture, and colours range from bright red to deep brown and blue.

Plain tiles are made in two sizes, 10½ in. by 6½ in. and 11 in. by 7 in. They are cambered in length so that when laid to lap the air gaps between tiles prevent capillary movement of water through laps. Each tile has two nibs at the head so that it can be hung on horizontal battens, and two holes for nails.

Pantiles are 13½ in. to 14 in. long by 9 in. to 11 in. wide. The cross section is of double curvature. This makes rainwater run off easily and protects the side laps. Where double cover is necessary in plain tiling, single cover is adequate in pantiling, and the roof pitch can be lower. Pantiles are hung to battens by a projecting nib and are also nailed. At ridges, eaves, hips, and valleys the space under the rising curve of each tile is filled with mortar and slips of plain tile.

Interlocking tiles, like pantiles, are of single cover. The sides, heads, and tails have grooves and projections which form a weather-proof interlock on the lap. There are several patterns. All have projecting nibs for hanging to battens and two nail holes for nailing. Best-known interlocking tiles are from Marseilles and Courtrai-du-Nord.

Pantiles and interlocking tiles of some types are made with the exterior covered with coloured vitrified glaze.

Asbestos-cement tiles of various colours are made in pantile form, and also in strips several feet long. Like clay tiles in appearance, they are much lighter.

Concrete tiles, both plain and interlocking and in a wide range of colours, are made of fine concrete with an admixture of pigment. In appearance they closely resemble clay tiles; they are highly durable.

FLOOR TILES. These are made in several hard or durable materials, including burnt clay, fine granite concrete, marble, and rubber bonded to an asbestos-cement base. They are laid in cement mortar on a concrete sub-floor. The joints can be butted closely together or put together in mortar ¼ in. to ½ in. wide.

Quarry tiles of burnt clay with a dense, smooth surface are widely used in kitchens, sculleries, and halls. The commonest sizes are 4 in. by 4 in. and 6 in. by 6 in.; red and blue are the commonest

colours. Coved skirting tiles are made to match.

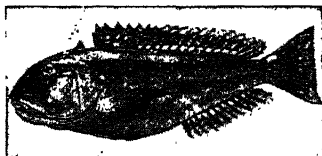
There are several kinds of decorative floor tiles of fine burnt clays, made in a range of colours. These are usually of small size and are laid in patterns. A chequer pattern of black and white squares is a favourite.

Concrete tiles are made in a variety of decorative types. The aggregates used in manufacture are hard wearing—e.g. such as granite or marble. Coloured sands and pigments are used to give various coloured effects. In manufacture, they are pressed into metal moulds in hydraulic machines.

WALL TILES. These are generally of glazed clayware and are made in various sizes up to 6 in. by 6 in. There is a wide range of colours and mottled effects, though white is generally favoured for the main surfaces with narrow bands of black or colours. Special tiles are made with rounded edges and angles for the tops of dadoes and for internal and external angles. Concrete tiles with smooth surfaces, incorporating coloured sands and pigments, are also used for wall tiling. Glass tiles of coloured opaque glass are used in bathrooms where their high cost is not objected to. Wall tiles are bedded on a cement and sand mortar; for appearance's sake, the joints are usually closely butted.

Wall tiles of all kinds are used also for fireplace surrounds, and glazed clay tiles are used for hearths. Slabbed fireplace surrounds and hearths are made with glazed clay tiles on a backing of strong concrete.

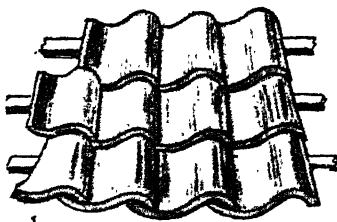
Tile Fish (*Lopholatilus chamaeleonticeps*). Spiny-finned marine



Tile Fish. Edible fish found on the slope of the Gulf Stream at a depth of 60-75 fathoms
American Museum of Natural History

fish of the order Teleostei, native of the Gulf Stream slope off New England. Closely related to the sea perch (*Serranus*), it is about a foot long. Its dorsal and anal fins have a few feeble spines.

Tile Ore. Term sometimes given to a reddish-brown, earthy variety of cuprite, an oxide of copper. The mineral takes its name from its resemblance to red tile.



Tilhar. Town of the Uttar union, India, in Shahjahanpur dist., on the Oudh and Rohilkhand rly. Its battle-mented brick wall is now in ruins. Pop. 24,000.

Tiliaceae.

Botanical name of the lime family. These trees and shrubs (a few herbs) are chiefly natives of the tropics, though the typical genus, *Tilia* (the lime) is found in Europe, N. Asia, and N. America. All have alternate, undivided leaves with toothed edges, complete flowers with five sepals and five petals, and produce nectar. Fruits and seeds vary. The inner bark of the lime furnishes the bast of the gardener, and the fibres of *Corchorus* are the jute of commerce.

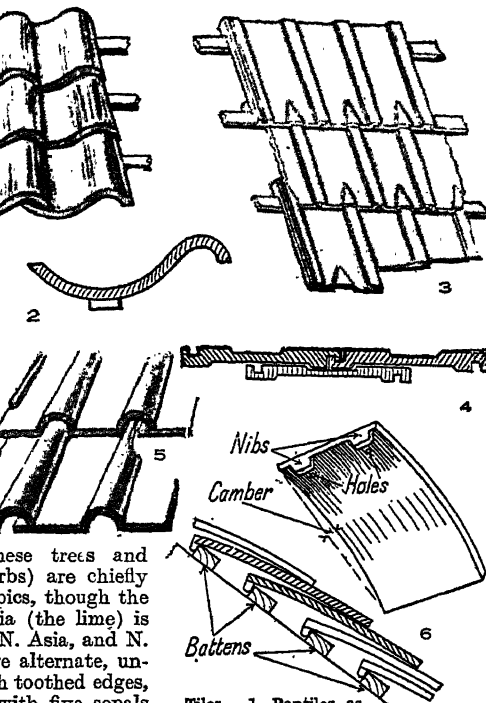
Till. Hardened boulder clay of glacial origin. The word is not commonly used nowadays, but from it is derived tillite, a rock name referring to ancient glacial deposits which are now consolidated to form hard rocks, and were formed in Ice Ages earlier than the last one. See Boulder Clay; Drift; Ice Age.

Till. River of Northumberland. It rises in the Cheviots and flows E. and then N. and N.W. until it joins the Tweed below Coldstream. Called in its upper reaches the Breamish, it is 32 m. long. Its chief tributary is the Glen, and it passes by Chillingham and the battlefield of Flodden.

Tillett, BENJAMIN (1860-1943). British labour leader. A Bristol boy, born Sept. 11, 1860, he went



Ben Tillett, British labour leader



Tiles. 1. Pantiles as laid on laths. 2. Section of pantile, showing nib which catches on lath. 3. Interlocking tiles, when laid. 4. Section of three interlocking tiles. 5. Italian tiling. 6. Plain tiles showing method of fixing

in the London dock district. There he organized the dockers' union, and later became secretary of the dock, wharf, riverside, and general workers' union. He was a leader of the great dock strike for 6d. an hour wages in 1889, and the organizer of others in 1911-12; also of the general federation of trade unions and the national transport workers' federation. Alderman of the L.C.C., he stood for parliament four times unsuccessfully before winning N. Salford for Labour, 1917-24 and 1929-31. The First Great War found Ben Tillett speaking strongly for the Allied cause to organized labour. An original member of the T.U.C. council, he was president of congress for 1929, retiring from union work two years later. His *Memories and Reflections* came out 1931, but he lived until Jan. 27, 1943.

Tilley, VESTA (b. 1864). Stage name of Matilda Alice, Lady de Frece, née Powles, British variety artist. Born at Worcester, May 13, 1864, she went on the stage as an infant and at 5 was giving impressions. As a male impersonator she won great popularity in the

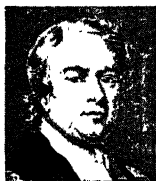
provinces, and her earliest London appearance was in 1878 at the Royal, Holborn. In 1882 she played in the Drury Lane pantomime. She retired from the stage in 1920 after the knighting of her husband, Walter de Frece (d. 1935). Among songs she made famous was *Following in Father's Footsteps*. Her autobiography, *Recollections of Vesta Tilley*, appeared in 1934.



Vesta Tilley,
British actress

Tillicoutry. Town of Clackmannanshire, Scotland. Situated on the Devon river, with a rly. station, it is 5 m. N.E. of Alloa. The principal industry is the manufacture of woollens, Tillicoutry shawls, plaids, tartans, and tweeds being famed for their quality. There are several churches, and an orphanage. Pop. 2,953.

Tillotson, JOHN ROBERT (1630-94). English prelate. Born at Halifax, he was educated at Clare College, Cambridge. At first a Presbyterian, he accepted the Act of Uniformity, and held in turn the positions of rector of Kedington, preacher at Lincoln's Inn,



John Tillotson,
English prelate

chaplain to Charles II, dean of Canterbury, canon of S. Paul's, and in 1689 dean of that cathedral. When Sancroft the non-juror was deprived of the see of Canterbury, Tillotson succeeded him as archbishop in 1691. He died Nov. 22, 1694. A tolerant divine with Puritan sympathies, and a tactful controversialist, he was the author of *The Rule of Faith*, and *Lectures on Socinianism*. His published sermons are among the best examples of the pulpit oratory of his age, and he was long admired as a master of prose. *Consult Works*, 3 vols., 1752.

Tilly, JOHN TIERCLAES, COUNT OF (1559-1632). German soldier. Of a Walloon family, he was born at Tilly, in Brabant, and served with distinction as a young man under Parma in the Netherlands, and against the Turks in Hungary. In 1610 he entered the service of Maximilian of Bavaria, head of the Catholic League, whose army he commanded in 1620. Rejoining

the Imperial service, he was made commander-in-chief on the outbreak of the Thirty Years' War. Tilly's victory at the White Mountain, Nov. 8, 1620, was the first decisive blow struck in the war, in which he proved himself the ablest commander upon either side until the appearance of Wallenstein and Gustavus Adolphus. His most notable victories were at Wimpfen.

May 6, 1622, and Lutter, Aug. 27, 1626. Another success, the capture of Magdeburg in 1631, was stained by frightful massacres. Though an excellent general of the old school, Tilly met more than his match when pitted against the genius of Gustavus, who routed his forces at Breitenfeld, Sept. 17, 1631, in spite of superior numbers, and again at the passage of the Lech, April 15, 1632, where the old soldier was mortally wounded, dying on April 30 at Ingolstadt. *See Thirty Years' War*.

Tilly Seed. Alternative name of the seed of a small tree, *Croton pavana*. *See Croton*.

Tilsit OR SOVIETSKY. Town of N. Europe. Lying 60 m. N.E. of Kaliningrad (Königsberg,) it was in E. Prussia until 1945, when, a bastion of the German defences of that territory, it was taken by storm by troops of the 3rd White Russian army on Jan. 20, to be later annexed and renamed. It was the scene of the final defeat of the Prussians by Napoleon in 1805; and on a raft in the middle of the Niemen (Memel), Napoleon and Alexander I of Russia signed in 1807 the treaty described below. Tilsit, an important centre of the German cellulose industry, developed also before the Second Great War such industrial establishments as iron foundries, machine shops, and oil and sugar refineries. Pop. approx. 57,000.

Tilsit, PEACE OF. Concluded on July 7, 1807, between France on the one hand and Russia and Prussia on the other after the defeat of the Russians at Friedland. Napoleon found it convenient to treat Russia well, giving her a free hand in Sweden and Turkey, provided she maintained his continental system in regard to foreign trade. Prussia, on the other hand, lost her possessions W. of the Elbe, and the slice of Poland she had obtained in the partition of 1793-95;

a heavy indemnity was imposed, and her standing army was reduced to 42,000 men.

Tilting. Term applied to a form of jousting introduced into the tournament about 1440, in which the lists (or course) along which the competing knights rode at each other was divided longitudinally by a barrier, called a tilt. Each knight was thus obliged to keep his own side of the tilt during the whole course, and the lance of each would consequently be inclined at an angle when the contact occurred, so that no direct hit could be made. There was a tilt-yard, much frequented by Queen Elizabeth, on the site of the present Horse Guards in Whitehall. Special armour was devised for tilting. A humbler form of tilting consisted in running with a pole at a quintain or suspended ring or other mark. From A.S. *tealt*, meaning unsteady, the word in modern usage indicates an attack, usually upon a stronger opponent or immovable object. Full tilt signifies headlong, at full speed. *See Eglinton Tournament; Quintain; Tournament*.

Timaru (Maori, Te-maru, place of shelter). Capital and seaport of the fertile dist. of S. Canterbury, N.Z. Timaru is 100 m. S. of Christchurch, beautifully situated upon sheltered Caroline Bay, on the main S. rly. line and main highway from Christchurch to Dunedin. It has a temperate climate with day after day of untroubled winter sunshine; its beach is safe and sandy; snow-clad mts. give a fine background.

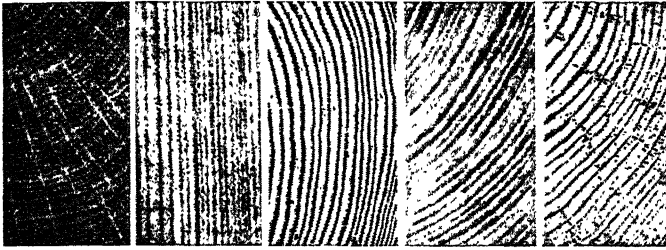
There is a well-constructed artificial harbour and an airport less than 1½ m. away. Industrial plants include freezing works, flour and biscuit mills, a woollen mill, pottery works, iron foundries, timber yards and sawmills, a shoe factory, and breweries. Pop. 17,650.

Timber. Term used for wood of sufficient size for commercial purposes. There are more than 6,000 varieties of timber trees. Timber is either hardwood or softwood. Hardwood is from trees bearing broad leaves, softwood trees having narrow or pin-like foliage. There are, however, exceptions: e.g. the timber of the yew which, botanically softwood, is hard and close grained.

The principal hardwoods are mahogany, oak, and walnut, mahogany being probably the world's finest decorative timber. The finest mahogany comes from Central America, Cuba and Honduras mahogany being outstanding. Easily accessible sources of these



Count John Tilly,
German soldier



Timber. Sections showing graining of British trees used commercially. Left to right, oak, elm, larch, ash, Scots pine

timbers were exhausted during 1830-60, largely owing to the introduction of French polishing, and existing mahogany lies far inland in the American forests, whence it is difficult to remove it. This has led to the development of an enormous trade in the less beautiful African mahoganies.

European oaks used commercially in the U.K. are the English and the Austrian. English oak varies greatly. There are fine up-standing trees with boles of good length and girth without branches, the timber of which is mild, and much used in reproducing period furniture. Other trees are dwarfed and knarled, and virtually useless except for gate posts. Austrian oak, from Austria and surrounding countries, is large in growth, mild, and knotless. After use it matures to a nut brown colour. It is much favoured for high class joinery work. Other oaks come from America, and from Japan and the mainland W. of Japan, the last also known as Japanese oak. Light in colour, it is used in furniture of contemporary design and good quality. Its principal fault is the smallness of the timber. American red oak is much used for mass produced furniture. American white oak, from the Appalachian mts., the lightest coloured oak, is a hard, close grained timber, growing to large proportions. It is much used for veneers in mass produced furniture and is polished near to natural colour.

The principal European walnuts are French, English, and Italian, all three having the same botanical name (*Juglans regia*) and belonging to the same family (*Juglandaceae*). All three are deservedly used as veneers. The French is of upright growth, rich in its almost parallel lines of brown, and is much used for cross-grained bandings. The figure of Italian walnut is rich and wandering. English being similar, but not so wild.

Northern pine is by far the most important European softwood. It grows from the lat. approxi-

mating to the S. of England as far as the northern Arctic. The more southerly the site of growth, the more quickly the tree develops, and the lighter in weight is the timber. The vast Siberian forests of northern pine are the slowest grown. Winter being perennial, the lifelong growth of the tree is slow and hardy, and in normal times its timber costs more per sq. ft. than average examples of African mahoganies.

The values of northern pine lie in the great quantities available, in its large resin content, which makes it resistant to decay, and in the different gradings. The quicker growths are used for exposed structural work such as roofing and for outbuildings. These and the next best qualities are used for carpentry house fittings, such as doors and windows and their surrounds. Northern pine from the N.W. of Europe is used for the sounding boards of pianos and other musical instruments. This and Siberian pine is used in high class joinery work and for good quality carving.

New Furniture Timbers

During the 20th century interest in furniture timbers has much increased with the desire to see the wood rather than to allow it to be disguised by polish. This has encouraged the introduction of new woods, or the reintroduction of woods that had little encouragement in the past. Yew is one of the most beautiful. Used as a veneer it blends well with mahogany. It varies in colour from golden yellow to golden brown, often being figured with a dark streak. The pores are so small as to give it a metal-like appearance. Macassar ebony has a stripy figure, varying from black to brown, brownish yellow and green; the wood is impressive, hard in texture, and rather cold in tone. Indian silver greywood, a light timber, is from yellowish brown to greyish brown, with occasional darker streaks. Australian blackwood, dark brown in colour, is an interesting timber

when well selected for figure and colour; such parcels as are worth while used in veneer form give magnificent effect. Australian silky oak is pinkish-brown. Light in colour, its medullary rays are more elliptical than in other oaks. The timber is mild and has not the strong appearance of the ordinary oaks. Indian laurel is a superior timber, dark brown and hard, finishing with a lustre. It is best used in veneer form. Australian black bean is similar to better qualities of Australian blackwood, and best used as veneer.

Walter Coventon

Timbre (Fr., tone). Musical term indicating distinctive quality. It designates not only those properties which distinguish different instruments and voices, but also those more subtle properties which distinguish, say, one violin from another. Quality is due to the presence and prominence of certain upper partials and to the form of sound waves.

Timbrel. An ancient percussion instrument of the tambourine (*q.v.*) type, covered, like the tambourine, with skin. It was often square or oblong, though also sometimes round.

Timbaktu,
TIMBUKTU,
TIMBUCTOO, OR
TOMBUCTOU.
City of French
Sudan. Situ-
ated on the

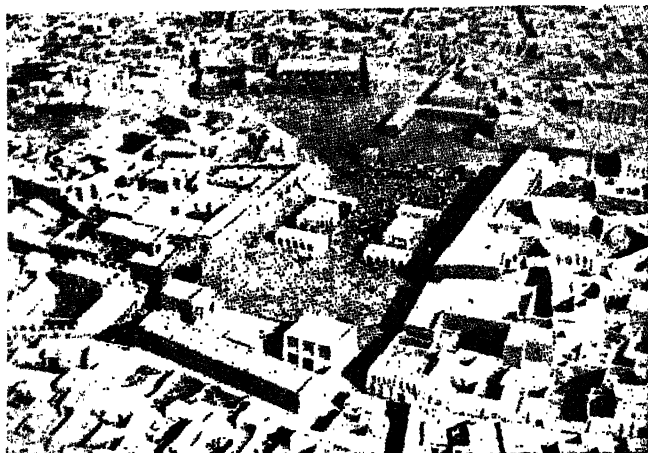


Timbrel used in modern orchestra

S. edge of the Sahara Desert, about 8 m. N. of the river Niger, it stands on one of the most important trade routes in W. Africa. It is in communication.



Timbaktu, French Sudan. Gateway to one of the city's mosques, distinguished by the curious wooden projections



Timbuktu, French Sudan. Air view of the 11th century city, showing the market square, centre

by means of small steamboats on the Niger, with Koulikoro, the terminus of the rly. from Ambididi and Kayes, the farthest navigable point on the Senegal river. It was founded in the 11th century, but did not become known to Europeans until after the visit of Ibn Batuta in 1350, after which date it gradually acquired a fame out of all proportion to its real importance. It was occupied by the French in 1894. The pop., at one time much more, is some 6,000.

Time. One of the fundamental conceptions, the perception of the sequence of events. Attempted definitions are too controversial to permit of their being given here.

The measurement of time is, in some respects, easier than its definition, and has always depended upon the constant recurrence of certain phenomena, e.g. the rising and setting of the sun, stars, etc. The day, month, and year are natural units of time on the earth, the second, minute, and hour artificial subdivisions of these. The astronomical unit of time is the sidereal day, the time it takes for one complete rotation of the earth to bring a star to its highest point in the sky on two successive occasions. It is suspected that this interval is not precisely constant; but no better time-keeper than the rotating earth is known.

Civil time cannot be based on sidereal time because of its practical inconvenience, so the period of rotation of the earth relative to the sun (the solar day) is used, for it is the sun that governs daily life. The apparent solar day varies in length at different times of the year, so its average (mean) value is chosen to define civil

time, and it is this mean solar day that is divided into the hours, minutes, and seconds of clocks. The difference in time between the actual position of the sun and its average, or mean position, i.e. the difference between the time shown by a sundial and by a clock, is called the Equation of Time (*q.v.*). Accurate instruments have made it possible to measure the time between constantly recurring events with increasing accuracy. Pendulum clocks reached their summit of precision in about 1920 with the Shortt free-pendulum clock. More accurate still is the quartz crystal clock, in which the electronically maintained vibrations of a quartz plate oscillating 100,000 times a sec. drive a dial. All time standards must, however, be checked by observations of the stars.

Standard Times

The earth makes one complete rotation on its axis in 24 hrs., which is equal to 15° in 1 hr. Since the earth rotates from W. to E., a place 30° E. of Greenwich will have noon 2 hrs. before Greenwich, and a place 30° W., 2 hrs. later. To minimise difficulties caused by this variation, standard times have been agreed internationally according to longitudinal belts. Each meridian of longitude divisible by 15 is taken, and the belt bounded by meridians 7½° on each side takes its time from the central meridian. Thus the following meridians divisible by 15 cross Canada: 60°, 75°, 90°, 105°, 120°, and 135° W. long. Therefore there are six standard time-belts in Canada, having noon, 4, 5, 6, 7, 8 and 9 hrs. after Greenwich. In Europe, standard

time is taken from the meridians 0°, 15° E., 30° E., and in Australia from those of 120° E., 142½° E. (the 135° passes through an area of sparse population), and 150° E.

The twelfth time zone reckoning eastwards from Greenwich would, on this system, keep time 12 hrs. fast on Greenwich. The same zone reckoned westwards would be expected to keep time 12 hrs. slow on Greenwich. There is therefore a discontinuity of a day on the 180th meridian, and at the international Date Line (*q.v.*), ships travelling E. drop a day from their reckoning, while ships travelling W. count the same day twice over. See Calendar; Clocks; Relativity; Sidereal Time; Space.

Time. In music, the measurement based on the periodicity of the accents, and classified according to the subdivision of the beats. It is not the same as tempo (*q.v.*). The instinctive desire for rhythm and proportion, which is as evident in music as it is in verse, gives rise to regularity of accent. If the accent occurs on every other beat, the time is duple; if once in three, then it is triple; and if once in four, it is quadruple. A bar-line is drawn through the stave or staves immediately before the accented beat, and hence it is commonly said that the accent falls on the first of the bar. If each of the beats is divisible into two lesser values, the time is simple; if divisible into three (the beat being dotted), it is compound. See Harmony; Music; Signature.

Time. American weekly news-magazine. First published March 3, 1923, under the joint editorship of Briton Hadden and Henry Luce (*q.v.*), it attempted to make the news of the day readable in narrative form. The journal rapidly became popular in the U.S.A., built up a news-gathering organization of its own all over the world, and started an edition which, printed in Paris, was sold in most countries of Europe.

Time and Motion Study. Method of attaining industrial efficiency, especially in mass production industries. It is applied by carrying out a careful analysis of all the movements involved in a particular operation. The layout of plant and equipment is then planned so as to eliminate unnecessary movements and thus to allow workers to carry out each operation in the minimum of time and with the minimum of fatigue.

Time and Tide. British weekly review of politics, literature, and the arts. It was founded in

1920 by Lady Rhondda (*q.v.*), who also edited it, and in it gave scope for serious contributions by women as well as men. Distinguished men and women invited to contribute to its Notes on the Way are allowed to express themselves freely irrespective of editorial policy. E. M. Delafield was on its staff, and her Diary of a Provincial Lady first appeared in its pages. Originally independent and non-party, from the 1930's it tended to veer to the right in politics.

Time Base. Device for the accurate measurement of time. A time base consists usually of an indicator which travels repeatedly over a fixed scale, starting its journey from a zero mark on the scale and making it always in the same time. At any instant the distance travelled by the indicator from its starting point is a measure of the time that has elapsed since the journey began. A time base thus converts time into straight-line or angular movement, making it possible to measure it with a foot-rule or a protractor, as the case may be.

The most familiar time bases are formed by the hands and the dials of clocks and watches. Starting from 0 (or 12) o'clock, the hour hand sweeps through 360° of angle every 12 hours, or 30° every hour. The hours can thus be indicated by marks 30° apart. A second time base indicator, the minute hand, travels over the same scale in one hour, passing through 6° of angle every minute. If the dial had no mark except that indicating zero, the time

signed to measure very small intervals of time with exactness. A micro-second is one-millionth of a second, and an express train travelling at 60 m.p.h. spends more than 900 micro-seconds in moving forward one inch. Yet the physicist requires time to be measured accurately to a small fraction of a micro-second. Operators without laboratory training can measure time to one-third of a micro-second when using radar equipment.

This is made possible by the application of time-constant (*v.f.*) circuits to the cathode-ray tube. A typical radar use of a time base is shown diagrammatically in the accompanying figure. The time-constant of R and C is, say, 300 micro-seconds. The arrival of the synchronising pulse from the transmitter causes the relay, which contains a 300-micro-second time-constant circuit, to apply a strong negative potential for that length of time to the grid of the time base discharge valve V. This closes the valve down. As no anode current is flowing, there would be no voltage drop across R and the anode potential would rise to 4,000 v. at once, were it not for the capacitor C, in series with R. Since the anode is tied to the junction between C and R, its potential at any instant is governed by the time-constant of C and R. This is 300 micro-seconds. The positive potential on the X₂ plate of the cathode-ray tube is that of the anode. Hence this potential increases for 300 micro-seconds, drawing the spot across the screen of the C.R.T. The distance which the spot has travelled across the screen is at any instant a measure of the time that has elapsed since it started its journey. By making the returning echo apply a brief negative potential to the Y₂ plate the spot is caused to make an upward movement for the duration of the echo pulse. The "break" in the trace caused by this movement serves as the indicator. The distance from the start or "origin" of the trace at which it occurs makes it possible to measure the time that has elapsed with great precision.

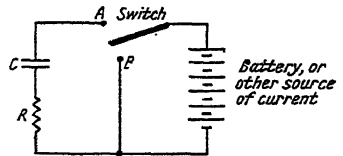
There are innumerable other applications of the time base, both in the physical laboratory and in everyday life. When, for instance, a motor-car crosses the bumper bar set in the road at some distance from an automatic traffic signal, it brings a time base into action. The time-constant of this is

adjusted to a suitable number of seconds. At the end of that time the charge across the capacitor is sufficient to trigger a relay which operates the switching of the lights. See Cathode-Ray Tube; Radar.

R. W. Hallows

Time Bomb. Popular term for a bomb with a delayed action. See Fuse.

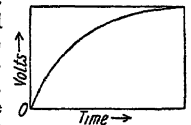
Time-Constant. Conception in physics. If a capacitor and a resistor, arranged in series, are connected to a source of current, as by turning the switch in Fig. 1 to position A, current flows into the capacitor and begins to charge



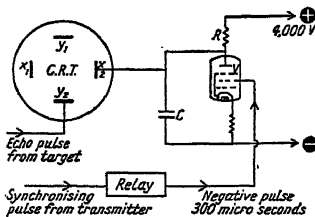
Time-Constant. Fig. 1. See text

it. To start with, current flows in without encountering much opposition and the charging rate is high. But as more and more electrons enter the capacitor, a potential is built up which opposes the E.M.F. driving the current in. The position is much the same as that encountered when one is inflating a flat tyre. To begin with there is no pressure in the inner tube to oppose the entry of the air pumped in. But as the tube fills the opposing pressure increases and the work becomes harder. Substituting lbs. per sq. in. for volts, the increase in the pressure in a tyre under inflation by hand would, if plotted against time, be represented by a curve shaped very much like that of Fig. 2.

In a capacitor under charge the E.M.F. built up by the inward flow of current develops a similarly increasing opposition. Rapid at first, the charging current tails off. Similarly the E.M.F. built up across the capacitor rises steeply at first and then shows a slower and slower build-up. The charging curve of the capacitor (Fig. 2) is exponential. No matter what the applied E.M.F., the capacitor always charges to 63 p.c. of this voltage in a time in secs. equal to the capacitance (in farads) multiplied by the resistance (in ohms).



Time-Constant. Fig. 2. See text



Time Base. Diagram illustrating how time-constant circuits may be used to produce a time base which enables very small intervals of time to be measured

could be determined accurately by means of a protractor. Clocks have also been made with straight-line scales and indicator movements. If such scales were ungraduated the time could be found with a foot rule.

The term time base is, however, most commonly used to describe electrical devices de-

Suppose that in Fig. 1 the battery has an E.M.F. of 100 v.; the capacitor, a capacitance of 2 micro-farads, and the resistor a resistance of 100,000 ohms. Expressed in farads, 2 micro-farads equal 2×10^{-6} . Therefore the voltage across the condenser is 33 v. in $2 \times 10^{-6} \times 10^5 = 2 \times 10^{-1}$, or 0.2 sec. This is the time-constant of the circuit. Given stable components, a circuit can be made up which will display any required time-constant indefinitely.

An inductance coil and a resistor in series have also their time-constant. In practice the leads to any capacitor or inductance coil (as well as the plates of the one and the windings of the other) must contain some resistance. It follows that, even if no actual resistor is used, every capacitor and inductance coil in a circuit must have its time-constant.

Time-constants have important applications in time base circuits. Their effects may also be of considerable moment in electrical circuits in which alternating or oscillating currents are present.

R. W. Hailows

Time Fuse. Type of fuse designed to explode in the air at a certain time after discharge. It is used mostly with shrapnel shells, which explode above the target. The working of the principal kinds of time fuses depends upon varying the length of a channel of gunpowder which, ignited at one end by the force of discharge, communicates at the other with the detonating charge. See Ammunition; Artillery.

Times, THE. British newspaper. Founded Jan. 1, 1785, by John Walter, it was for a short time known as *The Daily Universal Register*, and for many years enjoyed no eminence over its competitors. Its greatness began when John Walter II took over its management in 1803. His father died in 1812; he was then 36, and between then and his death in 1847 he gave his journal a place of its own, outpacing every rival. He organized a system of foreign correspondence which made *The Times* the principal source of information about international affairs throughout the world. It was the model upon which other journals fashioned their sheets; its news and articles were widely copied. Someone described it as "the raw material of journalism," implying that most other newspapers lived by adapting its contents to their own particular needs.

Journalists had been dependent mainly upon the government for information about foreign affairs. The second John Walter saw how important it was for city men to hear quickly all that was going on abroad; and he beat the government with the news of many great events, such as the battle of Waterloo. There exists in most foreign capitals the idea that *The Times* is also the organ of the British government; that has never been true since the second John Walter took command. Nor was it only in the contents of the paper that *The Times* led the way. John Walter III revolutionised the methods of printing. He was the first to print by steam, and the Walter press, first used in 1869, formed the basis of improvements later introduced.

It was John Walter II who appointed the most famous editors of *The Times*, Thomas Barnes in 1817 and John Delane in 1841. Barnes was the pioneer of independent, impersonal journalism, and the greatest editor of the century; the creator of the "Thunderer." Delane was much helped by his example, and extended the paper's acquaintance with everyone of political note. After Delane came Thomas Chenery, G. E. Buckle, Geoffrey Dawson, and Wickham Steed. In 1923 Dawson again was given charge. From 1941 R. M. Barrington-Ward was editor, and on his death in 1948 he was succeeded by W. F. Casey.

The *Times* has always been ready to attack abuses and denounce frauds. By a tablet in the office in Printing House Square is commemorated the exposure of a conspiracy to defraud London bankers in 1841. The bankers offered to refund the expense to which the paper had been put, but that offer was declined and the money went to found scholarships at Oxford and Cambridge. When John Walter III died in 1894 he left the paper to his second and eldest surviving son, Arthur, but by this time the property had been divided up among many. A little later Lord Northcliffe acquired a controlling interest, and under his energetic influence *The Times* regained the reputation it lost during the Parnell lawsuit of 1889. After his death in 1922, control passed to J. J. Astor and John Walter IV, who, by the creation of a trust, made arrangements to prevent the paper from being sold as a commercial undertaking.

One prominent feature of *The Times* for more than a century has been the letters to the editor, which gave rise to the saying, "I must write to *The Times* about it." Thus the paper has always been the national forum of discussion and, although its price has at times been high, an organ of opinion that no well-informed person can afford to neglect. The price has varied a good deal. It began at 2½d., and rose by stages to 1s. in 1806; then it dropped by stages to 3d., at which price it remained from 1861 to 1913. In 1914-16 it was 1d.; 1917, 2d.; in 1918, 3d. It fell in 1922 to 1½d., but next year was raised to 2d., and in 1941 to 3d.

Other publications issued from the same offices are *The Times Weekly Edition*, *The Times Literary Supplement* (weekly), *The Times Educational Supplement* (weekly), *The Times Review of Industry* (monthly), and *The Times Law Reports* (fortnightly). See Barnes, T.; Blowitz; Delane; Journalism; Newspaper; Northcliffe; Steed, H. W.; Walter, John. *Consult History of The Times*, vol. I, 1935; vol. II, 1939; vol. III, 1947.

Time Signal. Broadcast of exact Greenwich time by the B.B.C. The signal, which consists of six "pips" or dot seconds, is received from Greenwich observatory and radiated to listeners at regular intervals throughout the day. It is the final dot which indicates the appropriate point of time, which it does with a normal accuracy of within one twentieth of a second.

Times Square. Locality in New York City. The actual square is at the junction of Broadway, Seventh Avenue, and W. 42nd Street, but its name is applied to a district filled with theatres and other places of entertainment. Here the crowds gather on such occasions as New Year's Eve and the night of a presidential election. The illuminated advertisements here are famous.

Timgad. A ruined city of Algeria. It is 24 m. N. of Batna, and is situated at the intersection of six Roman roads. The Thamugas of the Romans, excavations here have uncovered the forum, the theatre, baths, temple of Jupiter, and numerous other buildings. The arch of Trajan is one of the best preserved of Roman triumphal arches.

Timis. Rumanian form of the name of the river described under its Hungarian form *Temes*.

Timisoara (Hung. Temesvar). Town of Rumania. Capital of the Banat, it was formerly a royal free city of Hungary. It stands on the Bega canal, 72 m. N.N.E. of Belgrade. The chief buildings are the 18th cent. R.C. cathedral, the Greek Orthodox cathedral, and the arsenal (built on the site of a castle erected by Hunyadi in 1442 and destroyed in 1849). A university was founded here in 1945. It has flour mills, breweries, tobacco, leather, cloth, and paper factories. During the Second Great War Russian and Rumanian troops captured Timisoara from the Germans, Sept. 19, 1944. Pop. 108,296.

Timmer. A comet, discovered by means of photographs taken at the Vatican observatory in Feb., 1946, and named after the Jesuit astronomer who first photographed it near the Great Bear constellation.

Timmins. Town of Ontario, Canada. Lying 450 m. N. of Toronto, it is served by the Ontario Northland rlys. and Trans-Canada airways. Centre of the Porcupine gold mining area, it has saw and planing mills. Pop. 28,790.

Timne or **Timni.** Negro people in Sierra Leone, and in adjacent dists. of French Guinea. They are the chief rice growers in Sierra Leone. Each village has its chieftain, and some dists. are placed under the authority of kinglets but controlled by the British administration. Political and social life is directed by a Poro secret society resembling that of the Mendi people S. of them, with elaborate initiation ceremonies in three degrees. There is a widespread practice of witchcraft.

Timok. River of Yugoslavia. Rising between Pirot and the

Stara Planina, it flows N. for about 100 m., to join the Danube, which it enters on the Bulgarian boundary. A battle was fought here between Bulgarians and Serbians, Oct. 11-28, 1915, beginning three days before the Bulgarian declaration of war. On Oct. 28 the Serbians fell back to a new line.

Timoleon (c. 411-337 B.C.). Greek soldier, the liberator of Sicily. Born at Corinth he was party to the murder of his brother when the latter endeavoured to make himself tyrant of the city. In 344, in response to an appeal from Syracuse in Sicily, originally a colony of Corinth, Timoleon led a small force to assist the Syracusans against the tyrant, Dionysius the younger, and against the Carthaginians. The latter were defeated outside Hadranum, and Dionysius offered to give up his Syracusan stronghold. Timoleon gained possession of the whole of the city, and re-established democratic government.

He then turned his attention to other Sicilian cities oppressed by tyrants, but meanwhile the Carthaginians had landed in immense force at Lilybaeum in 339. Timoleon signally defeated it, with a very much smaller force, however, on the Crimissus, and was then free to proceed with the liberation of Sicily from the tyrants. A peace was concluded with the Carthaginians in 338, by which the boundary of their dominion was fixed at the river Halycus. His work accomplished, Timoleon divested himself of all authority, and became a private citizen of Syracuse. He is the subject of one of Plutarch's Lives.

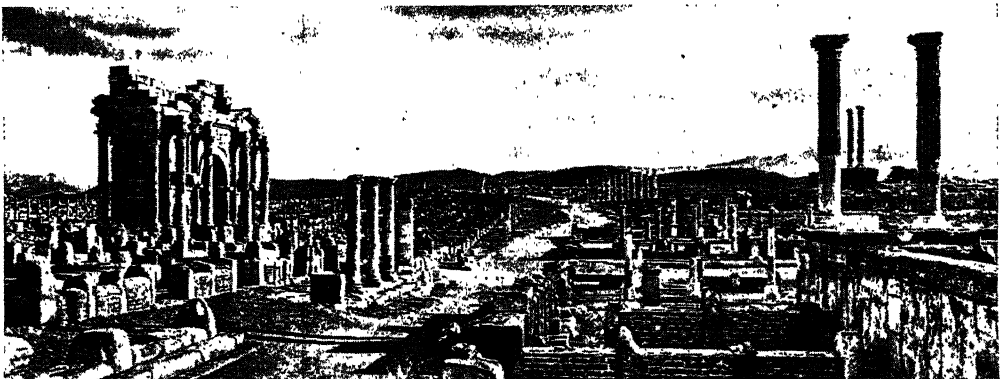
Timon. Athenian misanthrope of the 5th century B.C. He was so

disgusted with the conduct of his friends when he lost his fortune that he retired into seclusion, shutting himself up in a tower, into which nobody was admitted except Alcibiades.

Timon of Athens. Tragedy by Shakespeare. It tells how Timon, ruined by lavish entertainment of his friends, and deserted by them in adversity, becomes a bitter misanthrope, and retires from the world to die alone. Composed about 1607 and first published 1623, the play, of which part was written by George Wilkins, or by some other hand than Shakespeare's, is drawn from Paynter's Palace of Pleasure, Plutarch's Life of Mark Antony, and possibly Lucian's dialogue, Timon, or The Misanthrope, and Boiardo's comedy, Il Timone. It contains 2,358 lines, including 1,560 of blank verse and 596 prose. The play was fairly popular in the 18th century, but nowadays revivals are rare (Court Theatre, 1904; Old Vic, 1922; Westminster Theatre, 1935). It lacks dramatic appeal, and is valued only for the soliloquies of the chief character, which have been described as a "dictionary of imprecations."

Timon of Phlius (c. 325-235 B.C.). Greek sceptic, called Sillographer, writer of silloi, satirical poems on philosophers, dead and alive and their Tenets. Our perceptions and opinions, he says, are neither true nor false, therefore not to be trusted. It is not the phenomenon, however, but what is, that is in doubt. "I do not assert that honey is sweet, only that it appears so."

Timor. East Indian island, easternmost of the Sunda Islands. The N.E. half and the Ocussi en-



Timgad, Algeria. A southward view across the ruins of the ancient Roman city. To the left is the arch of Trajan, probably on the site of what was the city's western gateway. The colonnades, seen in the middle distance, are those of the market place, while the two columns on the right belong to the temple of Jupiter, and the two seen between are those of the Capitoleum. See facing page

slave are Portuguese, the remainder belonging to E. Indonesia (formerly Dutch). Portuguese territory covers 7,330 sq. m.; the main portion being 6,325 sq. m., Ocussi 950 sq. m., and the island of Kambirg 55 sq. m.; the E. Indonesian area is 24,449 sq. m. Pop., E. Indonesian, 1,657,376; Portuguese, 463,996.

The island is traversed by a series of parallel mountain chains, which culminate in Ramelau, 9,000-10,000 ft. Most of the coast is lined by coral reefs. The porous limestone causes much of the land to be sterile; the rivers are short, and useless for navigation or irrigation. Malaria has been common on the coast marshes. The people are said to be Belonese, with affinities to the Papuans, in the centre and E., and Timorese, related to the Malays, in the W. Dilly and Kupang are the respective Portuguese and E. Indonesian capitals.

The native crops are maize, rice, sugar-cane, bread-fruit, and bananas. Coffee, cocoa, and copra are produced for export. Horses and buffaloes are reared. Sandalwood, for which possession of the island was sought in the 17th cent., is still obtained from the forests. Pearl shell and bêche-de-mer are exported.

The Portuguese settlement dates from the 16th cent.; the Dutch occupied Kupang in 1618, and until 1851 there was continuous friction, especially as the respective territories were ill-defined. Treaties were made in 1860, 1893, and 1902 between the two powers, with indifferent results until the territorial question was determined by a convention in 1904, ratified in 1908. Portuguese Timor was made independent of Macao in 1896, and became an overseas prov. of Portugal in 1950.

During trade talks in 1941 between the Japanese govt. and the Netherlands authorities, the former demanded special facilities at the Timor aerodrome, refused by the Dutch. Shortly after Japan attacked the E. Indies, Japanese submarines were off the coast of Portuguese Timor, into which, on Dec. 18, 1941, Dutch and Australian forces moved since it was defended only by an ill-equipped company of native infantry. Although she had agreed on Nov. 4, 1941, that she would accept British protection here in the event of a threat of Japanese invasion, Portugal immediately protested against the Australian-Dutch action, and dispatched a

force to take over. Before this reached Timor, however, the Japanese had landed at Dilly and Kupang, Feb. 20, 1942, and soon occupied the whole of Timor. Survivors of the Allied troops, with native guerrillas, formed Sparrow Force (q.v.). Japanese installations and airfields were bombed from time to time by Allied aircraft, but no attempt was made to retake the island by force, and the Japanese remained in occupation until the general surrender of the forces in the Netherlands Indies at Morotai on Sept. 9, 1945.

It was on Timor that Bligh landed in 1789 after seven weeks in an open boat. *See* Bounty, Mutiny of the; Indonesia.

Timorlaut OR **TANIMBAR ISLANDS**. Group of coralline islands in the Malay Archipelago. It lies 260 m. E.N.E. of Timor. Yamdena, Selaru, and Larat are the chief islands. Maize, coconuts, bananas, and sweet potatoes are the chief products. The Japanese occupied Timorlaut after some resistance in July, 1942, and remained there until the general surrender of their forces in the Netherlands Indies at Morotai, Sept. 9, 1945. The group forms part of the state of E. Indonesia. Its area is 2,060 sq. m. Pop. 25,000.

Timor Sea. Name given to that portion of the Indian Ocean lying between the island of Timor and the N. coast of Australia, and leading to the Pacific by the Arafura Sea. *See* Indian Ocean.

Timoshenko, **SEMYON KONSTANTINOVICH** (b. 1895). Russian soldier. Son of a peasant, he was born at Furmanka, Bessarabia, and in 1910 joined the tsarist army as a machine-gunner, serving with the cavalry in the First Great War. He went over to the Red army at the outbreak of revolution in 1917, and earned reputation as a guerrilla leader. After the Polish war he studied strategy at the Soviet military academy, and then held district commands in White Russia, Kiev, N. Caucasus, and Kharkov.

During the Russo-Finnish war of 1939, Timoshenko built a replica of the Finnish Mannerheim Line where he rehearsed his troops before launching a successful attack on the fortifications. On July 11, 1941, three weeks after Germany's invasion of Russia, he was appointed to command the W. front, comprising White Russia and Poland. Although forced to give ground, he

held the Germans from Moscow by repeated counter-attacks until winter immobilised their mechanised forces. In 1942 he led the offensive that freed the Kerch peninsula; next year was in command on the northern front; and in 1944 was given charge of the 2nd and 3rd Ukrainian fronts.

Timotheus (fl. 354 B.C.). Athenian sailor and soldier. Son of Conon (q.v.), he held his first command in 378, and, after serving by sea and land against Sparta and Persia, in 354 was prosecuted for having failed to relieve Samos with the Athenian fleet in 356. He was condemned and sentenced to a heavy fine. Not having the money to pay, he was compelled to go into exile, and died soon after at Chalcis, in Euboea.

Timothy OR **TIMOTHEUS**. Companion of S. Paul. The son of a Gentile father and of Eunice, a Jewess of Lystra, he was probably converted to Christianity during Paul's first visit to that city. His ordination by Paul and the elders is recorded (1 Tim. 4, v. 14; 2 Tim. 1, v. 6), and the apostle circumcised him in order that his ministry might not be unacceptable to the Jews (Acts 16, v. 3). Timothy accompanied S. Paul to Europe, and was with him at both Athens and Corinth, on his third missionary journey, and in his imprisonment at Rome. He became bishop at Ephesus, where he is said to have been killed in a riot.

Timothy, **EPISTLES** TO. Two N.T. epistles ascribed to the apostle S. Paul, and belonging, with the Epistle to Titus, to a group known as the Pastoral Epistles, because they are addressed to pastors and deal with matters relating to the ministry. The two Epistles to Timothy, one of S. Paul's disciples and companions, purport to be written by the apostle; but external and internal evidence in support of the claim, in a complete sense, are considered weak by many scholars. It is urged against their authenticity that they are not included in the Canon of Marcion; that it is very doubtful whether any references to them are found in the writings of the earliest Church fathers; that it is difficult to fit them into the life of S. Paul; that the language and style differ considerably from his, and that the presupposed organization of the Church implies developments later than his time.

Thus it is held that, while the Epistles may contain genuine fragments of S. Paul's writings, on the

whole they appear to have been written in the name of the apostle, rather than by him. It is possible, however, to make out a strong case for the authenticity of the Epistles. Thus C. P. T. Grieron contends that the difference in style between the Pastoral Epistles and the other Pauline writings is due to the circumstance that, while the earlier epistles were addressed to churches at an early

stage of their development, the pastorals were written to individuals who presided over well-established Christian communities.

Timothy Grass. Hard grass cultivated in Europe and N. America for permanent pasture, also called Cat's-tail Grass (*q.v.*).

Timur Beg (1335-1405). Oriental conqueror, more familiar as Tamerlane (*q.v.*), the Anglicised form of his name.

TIN: THE METAL AND ITS USES

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Sources, method of extraction, properties, and principal uses of tin, are here described. See also Alloy; Blast Furnace; Bronze; Metallurgy; Pewter; Reverberatory Furnace; Roasting; Tin Ores; Tinplate

Tin has been known from prehistoric times, but one of its first uses, for making bronze during the early Bronze Age, occurred almost certainly by chance; mixed copper and tin ores were probably smelted together, giving a direct production of bronze. It is believed that the Phoenicians and ancient Greeks were familiar with tin, and it is probable that the builders of King Solomon's temple knew it. The Bible indicates its use in the time of Moses. In the later stages of the Bronze Age it seems certain that tin was smelted separately, because bronzes containing definite and distinct proportions of tin had specific uses. Methods of smelting were crude: tinstone was thrown periodically on to the glowing embers of an open fire built over an open trench; the molten tin ran into the well of the fire and was later scooped out. Later, bellows were used to give a forced draught and the blast furnace developed.

No native tin was found by the ancients, but the oxide occurs in surface deposits and it is very easily reduced to metal. The ancient Britons were familiar with slagging operations, but tin must have been scarce in Greece and Rome until Julius Caesar's conquests gave him access to the Cornish tin mines. The oriental bronze industry is very ancient, flourishing in China from 1800 to 1500 B.C., so that tin must have been known to the Chinese.

This silver-white, lustrous metal is very ductile and malleable, takes a high polish, is a poor conductor of electricity, and is not easily acted upon by the air. The element, chemical symbol Sn (from Lat. *stannum*, tin), has an atomic no. of 50; atomic weight, 118.70; density, 7.29 gm per c.c.; resistivity, 11.3 ohm cm.; melting

point, 232° C.; boiling point, 2,270° C; crystal structure: of grey tin, diamond type, with lattice constant $a = 6.461$; of white tin, tetragonal, being a highly distorted diamond type, with lattice constants $a = 5.8194$ and $c = 3.1753$. The two different crystal forms are allotropic modifications of tin, the grey tin being stable only at temps. below 13.2° C. Usually much lower temps. are needed to bring about the conversion, which is inhibited by very small amounts of impurities, and the grey form is rarely seen.

More than 60 p.c. of the world's tin comes from the alluvial deposits of Malaya, Burma, Siam, and Indonesia; similar deposits in China, Nigeria, and the Belgian Congo provide a further 12 p.c. The lode deposits of Bolivia provide 18 p.c., those of Cornwall 1 p.c. Total annual production exceeds 200,000 tons of the metal; its price (1948) is more than £550 per ton. Placer deposits are mined by dredging or by hydraulic methods, followed by sluicing.

Method of Extraction

The process of extraction of tin from its ores is relatively simple. As much purification as possible is effected by gravity methods, before smelting. The gravity separation is straightforward: cassiterite has a s.g. of about 7, compared with quartz 2.6, so that by the use of jigs, tables, and similar concentrating devices, rich concentrates, containing more than 60 p.c. Sn (pure cassiterite contains 78.6 p.c. Sn) can be produced. Lode tin often contains appreciable amounts of other metals as sulphides and it is easier to remove these before smelting than by later refining. After crushing and grinding, followed by jig concentration, the ore is roasted to convert sulphides

and arsenides to oxides, which can then be leached out of the concentrates. Sometimes a chloridising roast is followed by leaching. Tungsten and iron can be removed by magnetic separation, the cassiterite being non-magnetic, while at some plants flotation lifts the sulphides and the cassiterite remains in the cell tailings.

The final concentrate may be smelted either in a blast furnace or, more commonly, in a reverberatory furnace. Reduction is by carbon, from coke, coal, or charcoal. To prevent heavy losses by dusting, the material must be briquetted or sintered before it is smelted in a blast furnace, and this makes the process expensive. A water-jacketed blast furnace is used. The principal difficulty in reverberatory smelting is that SnO₂ is amphoteric, i.e. will act either as a base or as an acid. Thus, whether the slag is basic or acidic in nature, it will hold up a considerable proportion of tin, so the volume of the slag is reduced to a minimum by having as rich a concentrate as possible. The slag, which contains more than 10 p.c. Sn, is then re-treated, the final slag containing less than 1½ p.c. Sn. The tin from this re-treatment is impure and contains a high proportion of "hard-head," the alloy of tin with iron.

Processes of Purification

Crude tin varies widely in purity; further purification can be effected by liquation, followed by "poling," "tossing," or "boiling." In liquation, the tin is heated to just above its melting point on a sloping hearth, so that it melts and runs away from the higher melting point impurities. The product is then remelted and wooden poles are inserted beneath the surface, so that the melt boils, giving ready access of air to oxidise the remaining impurities, which float to the surface and are subsequently removed as a slag. A similar effect is secured by tossing the tin in ladles and splashing it back into the melt. The molten tin is then held for some time to allow any heavy impurities to settle to the bottom. Electrolytic refining has been used, but is not common practice. The tin of commerce has a purity of 98.7 to 99.99 p.c., and in order that a brand of tin may be registered as standard at the London metal exchange it must assay at least 99.75 p.c. and be of good merchantable quality. Banks and Billiton crude tin assays more than 99.9 p.c. Sn without refining.

The purest forms of tin are required for the tinplate industry, which consumes more than 40 p.c. of the world's output. The pure metal is soft and can be rolled into foil or extruded into tubes merely by pressure. It has a low tensile strength of about 1 ton per sq. in. and a Brinell hardness of about 4. If a bar of tin is bent, it emits a characteristic creaking sound, called the "cry" of tin, caused by the chafing of the crystals against one another. Chemically tin has good resistance to air and water corrosion, which accounts for its use as a protective coating for other metals. It is readily soluble in hot hydrochloric or boiling sulphuric acids, and it also dissolves in hot solutions of the caustic alkalis, giving stannates. It forms two oxides, SnO and SnO_2 . Apart from tinplate, the chief uses of the metal are in alloys, the most important being solders, bronzes, white bearing metals, pewter, type metals, and Britannia metal for cutlery and kitchen wear. The chlorides are used as mordants for dyeing calico and the natural and artificial silks used for stockings. The oxide is used as an opacifying agent for white enamels and glazes, and stannic sulphide is the commercial mosaic gold, used for gilding and imitation bronze work.

Tin, ORES OF. In nature tin occurs chiefly as the oxide, cassiterite (*q.v.*). Other tin bearing minerals are so rare as to have little economic importance. The vein deposits of Bolivia contain small amounts of stannite, $\text{Cu}_2\text{S}_2\cdot\text{FeS}\cdot\text{SnS}_2$, cylindrite, $\text{Pb}_2\text{Sb}_2\text{Sn}_2\text{S}_{11}$, and franckeite, $\text{Pb}_2\text{Sb}_2\text{Sn}_2\text{S}_{11}$. Tin does not often occur in the metallic form in nature. There are two groups of tin ore, the vein or lode deposits and the alluvial or placer deposits.

Tin ores are always associated with acid igneous rocks, such as granite, in quartz veins and pegmatites, associated with topaz, tourmaline, chlorite, and fluorite. The enclosing rock is commonly altered to greisen (*q.v.*). Tin ores are generally found near the contact of the parent granite, this zone being surrounded by outer zones carrying copper, lead-zinc, silver, and iron. This zonal arrangement is well seen in Cornwall. Tungsten and tantalum ores are often closely associated with tin mineralisation.

Tinacina. Group of families of minute moths. Among numerous British species are the clothes moth, corn moth, and others

which are domestic and commercial pests in the larval stage.

Tinamou (*Tinamus*). Genus of S. American birds belonging to the small family Tinamiformes. It is nearly related to the game birds, but is thought to have affinities with the Ratitae or flightless birds. In general appearance they are rather like partridges, and they are usually found among the long grass in the plains. They run like rails, and when hard pressed fly swiftly, but are soon exhausted. Tinamous are highly valued for the table, and this has led to their virtual extermination in many districts.

Tincture. Tinge or shade of colour. In medicine, it is the solution of active principles of drugs in alcohol. In heraldry, it is applied to the two metals (or and argent), to the seven colours (gules, azure, vert, sable, purpure, tenné, and murrey or sanguine), and to the three chief classes of fur (ermine, vair, and potent).

Tindal, MATTHEW (c. 1653-1733). English deist. He was born at Beer Ferris, Devon, and



Matthew Tindal,
English deist

educated at Lincoln College, Oxford, was elected a fellow of All Souls in 1678, and in 1685 became an advocate at Doctors' Commons. About this time he joined the Church of Rome, but returned to the Church of England in 1688. He wrote controversial works, including *The Rights of the Christian Church Asserted*, 1706, which the house of commons ordered to be burnt, and *Christianity as Old as the Creation*, 1733. Critics of these works maintained that Tindal's profession of Christianity was purely politic. He died at Oxford, Aug. 16, 1733.

Tinder. Inflammable material consisting of half-burned linen, decaying wood, amadou, touch-paper, etc. Such material is easily fired by means of a spark from a flint, and it was widely used for making a light before the advent of the friction match, a tinder-box being a compact portable arrangement of flint and tinder, a larger ancestor of the modern automatic petrol lighter. See *Firemaking*.

Tinea. Disease of the skin due to a fungus. See *Ringworm*.

Tinfoil. Thin lead or tin sheet used for wrapping tobacco, sweets,

etc. The term foil is used of many metals when in extremely thin sheets. See *Foil*; *Tinplate*.

Tinnevely. Dist. and town of Madras state, India. The dist. lies between Travancore and the Gulf of Manaar. Rice, cotton, native food grains, and pulses are the main crops. Area, 4,342 sq. m. Pop. 2,244,543. The town is on the rly. from Tuticorin to Quilon. Pop. 60,676.

Tinos or **TENOS.** Island of the Grecian Archipelago, one of the Cyclades group. Separated by a narrow channel from the island of Andros, immediately to the N.W., it is 17 m. in length, with an average breadth of 5 m., the area being about 80 sq. m. Its surface is mountainous, rising in Mt. Skhionia to 2,340 ft., but there are fertile valleys. The chief products are marble, wine, cereals, and figs. The principal town is Hagios Nikolaos (S. Nicholas), built on the site of the ancient Tenos. Ruins of a famous temple of Poseidon or Neptune were revealed by excavation in 1902.

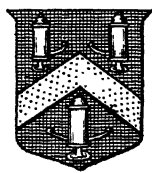
Tinplate. Thin sheets of mild steel (formerly wrought iron), coated with tin. The substance is favoured for food containers, chiefly because tin does not give rise to poisonous substances when in contact with most foods. The tin coating on the steel is of pleasing appearance, and also facilitates soldering.

In the older method of manufacture, mild steel ingots were hot-rolled to bars, usually 8 ins. wide. These bars, cut into suitable lengths, were then hot-rolled to sheets in the tin mill. The steel was rolled as a composite pack, formed by laying the sheets on top of one another (matching), and also by folding them (doubling). After hot rolling, the packs of sheets were sheared to size, the sheets separated, pickled in acid to remove scale from the surface, and annealed. They were cold-rolled between polished rolls to impart a good surface, and then annealed and pickled to give "black plate." Next came the hot dip coating operation, passing the black plate through flux into the pot of molten tin, and finally through palm oil. The tinned sheet was passed through rolls to distribute the still molten tin, then through bran and polishing rolls to remove excess palm oil and impart a bright surface. This has been the method of tinplate manufacture in S. Wales for years.

It is being superseded by the production of tinplate in continu-

ous strip form, by utilising continuous hot and cold strip mills, and electrolysis for the tin coating. The steel strip is passed through tanks containing an electrolyte of stannous chloride and anodes of tin, and receives a tin coating which is dull in appearance. Then the coating is temporarily melted by the passage of an electric current, and the strip allowed to cool in air. About 600 ft. per min. passes through the electrolytic tinning line. Most of the development of this process was done in the U.S.A. British tinplate was first produced in this way at Ebbw Vale in 1947.

Tinplate Workers' Company. London city livery company. Originally associated with the



Tinplate Workers' co. arms

Wire-workers and Pinners, with whom it combined with the Girdlers in 1569, it was granted a charter in 1671. It has done much to promote the interests of the tin and wire-work industries. The offices were at Bakers' Hall, Harp Lane, E.C., but on their being destroyed in the Second Great War the co. moved its headquarters to 3, Albany Court Yard, W.1.

Tinsel (Fr. *étincelle*, Lat. *scintilla*, spark). Highly polished sheets, strips, or disks of metal foil used chiefly for ornamental purposes. The metals mainly used are copper and brass. The strips are generally lacquered in bright colours, or silver-plated on one side to add to their effect.

Tintagel. Village and parish of Cornwall, England. Situated on the coast, 5 m. N.W. of Camelford, it is one of the most picturesque places in the county and has many historic associations. The parish church contains tombs and early remains. Tintagel Castle, the reputed birthplace of King Arthur, stands on a ridge of rock connecting Tintagel Head to the mainland; much has been destroyed by action of the sea, but the 13th century walls remain in parts, and near by is a small chapel of the same

period. The castle has been the theme of many medieval romances, of poems by Tennyson, Swinburne, and others, and of a musical tone-poem by Sir A. Bax. It probably existed in pre-Saxon times, and is spoken of by contemporary writers as being in ruins in the early part of the 16th century. Parts were restored in the 19th century.

Tintern Abbey. Ruined abbey on the Monmouthshire bank of the river Wye. It is beautifully situated 5 m. N. of Chepstow. A Cistercian house was founded here by Walter de Clare about 1131. The magnificent building was mainly erected between 1269 and 1287 by Roger Bigod, earl of Norfolk. Cloisters were added about 1470. The chief remains are the ruins of the cruciform church, 228 ft. long by 150 ft. broad. The east and other great windows are especially noble; less remains of the chapter house, refectory, and other spacious buildings. The abbey, dissolved in 1537, was long the property of the duke of Beaufort, but in 1900 was acquired by the crown, and extensive repairs were undertaken. A sight of Tintern Abbey inspired one of Wordsworth's great poems. Near the village is a rly. station. See Abbey illus. p. 7.

Tintometer. Apparatus for determining the depth of a tint of colour by comparison with standard tints. One apparatus consists of a combination of standard coloured glasses so arranged that all side light is obscured. The colour under examination is compared with various tints, obtained by different combinations of the glasses, until the correct tint is reached.

Tintoretto (Ital., little dyer). Popular name of Jacopo Robusti (1518-94), Italian painter. Born in Venice, Sept. 16, 1518, son of a dyer, he was apprenticed to Titian, and was influenced by Michel-

angelo, but largely taught himself by studying anatomy and modelling. His first important work

was the *Miracle of S. Mark*, 1548, painted for the Scuola di San Marco, later placed in the Venice academy. In 1558 he married Faustina dei Vescovi. Venice possesses the most famous of Tintoretto's paintings: over 60 works in the Scuola di San Rocco, the decoration of which he began in 1560; others in the church of San Rocco, the Collegio, and the doge's palace. Examples in the National Gallery, London, and at Hampton Court.

While engaged in the Scuola, he painted three pictures yearly, and received an annual salary of 100 ducats. His genius was veritably a tremendous capacity for work. The great Crucifixion picture in the refectory of the Scuola has been acclaimed his masterpiece, as illustrating at their best his extraordinary draughtsmanship, resonant colour, and sense of dramatic composition; but his Presentation in Madonna dell' Orto, and many more, are hardly less arresting. By sheer sweep of design and courage in conception he takes rank among the world's greatest painters. His last work of importance was the Paradise, in the doge's palace, supposed to be the largest painting ever executed. It measured 74 ft. by 30 ft., and was considered by Tintoretto the crowning work of his life, which ended on May 31, 1594. See Italy: Art; Venice; consult Four Great Venetians, F. P. Stearns, 1901; Tintoretto, E. M. Phillips, 1911.

Tiny Tim. Character in Dickens's story, A Christmas Carol. He is the crippled, youngest, and favourite child of Bob Cratchit, the poor clerk. In Scrooge's vision of the future the child dies, a prospect which helps as much as anything else in the vision to melt his flinty heart. Tiny Tim's toast, "God bless us, every one," is famous.

Tip Cat. Outdoor pastime. It is played with a piece of rounded wood about 4 ins. long, pointed at both ends, which is called the cat, and a staff similar to a rounders club. A circle, usually about 6 ins. in diameter, is drawn 8 or 10 ft. from a point chosen as the pitcher's base or wicket. From his base the pitcher attempts to throw the cat into the circle, the striker being



Tintoretto. Self-portrait by the Italian painter



Tintagel, Cornwall. The rocky ridge, crowned by the ruins of the castle which, according to tradition, was the birthplace of King Arthur

out when he succeeds. Should the cat lodge on the line of the circle, the striker is permitted to make one stroke at it. In the kind of tip cat called piggy, the player hits a pointed end of the cat downwards so that it bounds into the air, and then attempts to strike it away from him.

Tippecanoe. River of Indiana, U.S.A. It rises in the N. of the state, and flows about 200 m. S.W. and S. to join the Wabash 10 m. above Lafayette. On Nov. 7, 1811, General Harrison defeated the Indians near the mouth of the river.

Tippera. Dist. of Pakistan, in the Chittagong division of E. Bengal. It lies E. of the Surma river on the edge of the Ganges delta, and is an alluvial lowland, four-fifths of which is cultivated, mainly for rice and jute. The area is 2,531 sq. m. Annual rainfall, 84 ins. This is one of the most densely populated districts in Bengal. Seven-tenths of the pop. of 3,860,139 are Muslims.

Tipperary. County of Munster, Eire. An inland county in the S. of the country, its area is 1,643 sq. m. The centre is mainly level and fertile, but on the borders are hills: the Knockmealdown Mts. on the S.W.; Keeper Hill on the W.; Devilsbit Mt. on the N.; the Slieveardagh Hills on the S.E. Another range is the Galty Mts., with Galtymore, 3,015 ft., highest point in the county, one branch of which is called the Tipperary Hills. The chief river is the Suir, while along the N.W. boundary flows the Shannon. In the W. is the fertile Golden Vale. Agriculture is the chief industry, the most flourishing branch being dairy farming, but coal, copper, and slate are worked. The Eire state rlys. serve the county. Clonmel is the co. town; other places are Tipperary, Cashel, Thurles, Carrick-on-Suir, Caher, Roscrea, and Nenagh. Tipperary became a county palatine in 1328, the Butlers being its lords, and they retained their exceptional rights therein until 1715. In the S.W. are some interesting stalactite caverns. For administrative purposes Tipperary is divided into two counties, N. and S., each with its own council. The co. returns seven members to the dail. Pop. 135,981.

Tipperary. Market town and urban dist. of co. Tipperary, Eire. It is 110 m. S.W. of Dublin and 23 m. S.E. of Limerick by the Eire state rlys. The buildings include R.C. and Protestant churches. Tipperary is an agricultural centre, having a large trade in farm and dairy produce, and works for mak-

ing condensed milk. It was made a borough in 1310, having grown up around a castle built by the English. It had also an Augustinian monastery, of which there are remains. The town was prominent during the land struggle in Ireland, New Tipperary being founded 1890 for evicted tenants. Pop. 5,266.

Tipperary. Short name for a popular song. It's a long, long way to Tipperary. Written and composed by Jack Judge in 1911, it had an extraordinary vogue in the autumn of 1914, when the troops mobilised for the First Great War used it as a marching song. That the song had nothing to do with the war is evident from the date of publication, and the character of the words, which simply tell of an Irishman's longing to be with his sweetheart. The song remains associated with the "Old Contemptibles" of the First Great War. From 1915 to the end of the war it was scarcely heard in the army; but it remained a popular community song throughout the Commonwealth.

Tippermuir, BATTLE OF. Fought Sept. 1, 1644, on a plain 3 m. W. of Perth, between the Scottish Covenanters and a Royalist force commanded by Montrose. A force from Ireland having been landed to aid the Royalist cause, Montrose called the clans to arms. His troops numbered only about 3,000, but with these he boldly attacked and completely defeated the Covenanters, of whom there were 7,000 foot, and from 700 to 1,000 horse with nine guns. Some 2,000 Covenanters were slain, many were taken prisoners, and Montrose was able to occupy Perth. This was the first of his six celebrated victories for the Stuarts.

Tippet. Cape of fur or other material for the shoulders. Tippetts are an item in the official costume of judges and clergy, and frequently form part of the outdoor livery of coachmen and footmen. Anciently the tippet was the pendant part of the hood or sleeve. See Costume; Hood.

Tippett, MICHAEL KEMP (b. 1905). British composer. Born in London, Jan. 2, 1905, he was educated at Stamford grammar school, studied composition under Charles Wood at the R.C.M., and became a conductor to L.C.C. organizations. From 1940 he was musical director at Morley College. His oratorio, *A Child of Our Time*, first performed 1944, of which he wrote text as well as music, was based on an incident in the Nazi persecution of Jews. Tippett's

music, evocative and lyrical, was deeply expressive of the tragedy of the contemporary scene, and notable also for its sense of restraint. He wrote much for strings, e.g. three quartets, and a concerto for double string orchestra. A symphony was first played in 1945, and variations for piano and orchestra in 1942.

Tippoo Sahib (1749-99). Sultan of Mysore. Son of Haider Ali (q.v.), whom he succeeded in 1782,



Tippoo Sahib, Sultan of Mysore

he fought during the first Mysore War, concluding the treaty of Mangalore in 1784. Two years later he declared war on the Mahrattas, and in 1789 attacked Travancore, a state allied with the British. This occasioned the second Mysore War, which ended in Tippoo's defeat in 1791. Founding a secret confederacy of all discontented native rulers, and strengthened by the promise of French help, Tippoo planned vast schemes for the expulsion of the British and his own exaltation. But the plot was discovered, Wellesley made a rapid advance on Seringapatam, and Tippoo was slain in the capture of the city, May 4, 1799. See Seringapatam; consult also Haider Ali and Tipu Sultan, L. B. Bowring, 1893.

Tippoo Tib. Name by which Hamed ben Mohammed, African slave-trader, was known. Of mixed Arabian and African blood, he traded in Equatorial Africa, especially in Upper Congo. Aiding Cameron in 1874, and Stanley in 1886, and taking part in the Emin relief expedition of 1887, he was given the governorship of the Stanley Falls district of Upper Congo. Consult Tippu Tib, H. Brode, Eng. trans. 1907.

Tipstaff. Official of the English high court of justice. The name is derived from the staff of office, which is tipped with metal or with a small crown. Tipstaffs are appointed to the chancery and king's bench divisions, and their duty is to make arrests, in the precincts of the court, of such persons as are committed for contempt or other offences. See Bailiff.

Tipton. Mun. bor. of Staffs, England. It is 8 m. N.W. of Birmingham, and has six rly. stations. Chief industries are motor engineering and manufacture of

electrical equipment, furniture, machine tools, toys, glass, etc. The parish church of S. Martin has the oldest church registers in England, starting in 1513. With Rowley Regis, Tipton forms a bor. constituency. Pop. 38,884.

Tiraboschi, GIROLAMO (1731-94). Italian literary historian. He was born at Bergamo, Dec. 18,



Girolamo Tiraboschi,
Italian historian

1731, and after being professor of rhetoric at Milan was appointed in 1770 librarian to the duke of Modena. His chief work, *Storia della Letteratura Italiana*, 13 vols., 1772-82, is the standard history of Italian literature down to the beginning of the 18th century. He died at Modena, June 3, 1794. *Pron.* Teera-boskee.

Tirach Mir. Mt. of Pakistan. It is the culminating point, 25,426 ft., of the great S. spurs of the Hindu Kush, which penetrate into Chitral in the N.W. Frontier province.

Tirah. Dist. of Pakistan, in the N.W. Frontier province. It comprises all the glens on the S. side of the Safed Koh Range, of which the drainage is united into, and flows by, the Bára river into the Kabul. It falls within the tribal territories of the prov. The tribesmen, Afridis and Orakzais, are diligent cultivators of the lower slopes and valley floors, and in the summer the Afridis retire from the malarious lower valleys to the elevated glens.

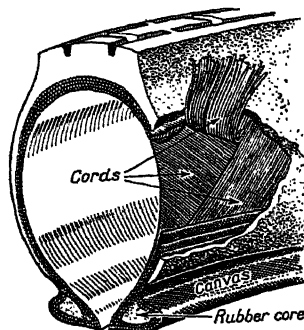
Tirah Campaign. British expedition against the Afridis and Orakzais, 1897-98. British posts in the Khyber Pass garrisoned by Afridi militia having been overwhelmed by Afridi insurgents, a force of 35,000 men under Sir William Lockhart was sent to operate in the Tirah and Mastura Valleys. The operations, based on Kohat, began by the capture of the Dargai heights, Oct. 20, 1897, followed by the storming of the Sempagha Pass leading into the Mastura Valley, Oct. 29, and of the Arhanga Pass leading out of it into the Tirah country, Oct. 31. The latter region was then scoured by brigades, many walled villages being destroyed, in spite of the resistance of the Afridis, who on several occasions inflicted considerable loss on the British columns. Saran Sar was captured by Gaselee's brigade, Nov. 11, and the Waran and Rajgul valleys were

cleared by Kempster's and Westmacott's brigades respectively. The force returned to India by two routes and, a junction having been effected near Peshawar, the Khyber forts were retaken. The Afridis then sued for peace, terms were imposed, and the expeditionary force was dispersed, April, 1898.

Tirana. Capital of Albania. It lies 20 m. E. of the Adriatic coast at Durazzo, at the S. end of the plain of Kruja, overlooking the Rushka valley. Gloriously situated, Tirana is a picturesque rather than a comfortable or organized place, dating from the 17th century. Most of its pop., est. 31,000, are Muslims. There is a court of cassation. After the Italians occupied Albania in April, 1939, they built a military airfield near the capital, which itself remained in Axis hands until Nov. 18, 1944, when the German garrison withdrew before advancing Allied and partisan forces. It was badly damaged in the course of the war. Tirana gives its name to a prefecture of Albania which has a pop. of 57,808.

Tiraspol. Town and region of Moldavia S.S.R. It is on the left bank of the Dniester and the Odessa-Kishinev rly., 70 m. N.W. of Odessa. There are horticultural and tobacco-growing industries and others concerned with tallow and soap. Taken by the Germans during their advance on Odessa in the summer of 1941, Tiraspol was recaptured April 12, 1944, in a night assault by the 3rd Ukrainian army. Pop. approx. 35,000.

Tire or TYRE. Hoop, band, or air filled tube on the rim of a wheel. The steel tire of a wooden carriage or cartwheel binds the felloes and spokes tightly together,



Tire. Section of beaded edge cord tire showing two diagonal layers of cord

and takes the wear of usage. The tire is made rather smaller than the wheel in the first instance, is expanded by heat till it will pass

over the felloes, and is allowed to cool. The rolled-steel tire of a railway locomotive, carriage, or car wheel is shrunk on to the cast iron or steel centre in a similar way. A projecting lip on the outer face, and a ring forced into a groove at the other side, make it impossible for the tire to move laterally should the shrinkage grip prove insufficient. The shrinkage allowance is about $\frac{1}{1000}$ in. for every in. of diameter; thus a tire for a 50-in. wheel centre would have, before the heating, an internal diameter of about 49.950 ins. Railway vehicle tires are 5-5½ ins. broad, at least an inch thick, and made of the best steel. The tread is coned to an angle of 1 in 32 towards the outside edge. Flanges are 1 in. deep and 1 in. wide. If a locomotive has a large number of driving wheels coupled together, some of the tires may be extra wide and flangeless, to facilitate travels on curves.

The width of road locomotive and vehicle tires, relatively to the weight carried by the wheel and the wheel's diameter, has been made the subject of legislation in many countries.

The invention of the bicycle led to the introduction of a solid rubber tire, which was held on to the rim by a wire or wires embedded in it or by beads engaging with the flanges in the rim. The pneumatic tire, adopted universally for cycles, motor cars, transport vehicles, tractors, and aircraft, was invented by Thomson in 1846, but was first put to practical use by Dunlop, who in 1888 fitted a bicycle with a crude form. In the pneumatic tire are two separate parts: an air container of rubber, the inner tube; and a cover with cotton, rayon, nylon, or steel composition, protected by a plain or patterned tread of compounded rubber. The cotton, rayon, nylon, or steel cords are insulated with specially compounded rubber. A complete tire may have one or more layers of cords. It is held in position on the rim by coils of high tensile insulated steel wires. See Dunlop; Motor Vehicle; Rubber.

Tiree or TYREE. Island of the Inner Hebrides, Argyllshire, Scotland. Situated 3 m. S. of Coll and 15 m. W. of Mull, it is 14 m. from N. to S., and averages 3 m. in breadth. There are two small harbours, Searinish Bay in the N.E. and Hynish in the S. A pink marble spotted with green is found. The chief occupation of the crofters is rearing and exporting

horses, cattle, and poultry. The island forms a parish which includes Skerryvore, famous for its lighthouse, some 10 m. to the S.

Tiresias. In Greek legend, a soothsayer of Thebes. He was blind from childhood because, according to one story, he had seen Athena bathing. Athena, having been entreated to restore the sight of Tiresias, gave him instead the gift of prophecy, which he exercised until he died at a great age. He also understood the speech of birds. He appears in many legends, including those of Hercules and Oedipus, and Odysseus consulted him in Hades. Tiresias is the title of a poem by Tennyson.

Tiridates. Name of several Parthian and Armenian kings. (1) King of Parthia, 32 B.C., and successor of Phraates IV, against whom his subjects had revolted. Driven out in his turn, he took refuge with Augustus, who refused to hand him over, but would not reinstate him. (2) Grandson of Phraates IV, brought up in Rome and set up as king of Parthia by Tiberius, A.D. 35. (3) Brother of Volgaeses I, by whom he was made king of Armenia about 54. Severely defeated and more than once driven out of Armenia by Nero's general Domitius Corbule, he gave up his crown, which was restored to him by Nero in 66. (4) King of Armenia in the 3rd century, twice expelled by the Persians and definitely restored by Diocletian after the peace of Nisibis, 298.

Tirlemont. Town of Belgium, in the prov. of Brabant. It lies on the Grande Gette river, 11 m. by rly. S.E. of Louvain, and is a junction on the Brussels-Liège rly. There are sugar, brewing, and tanning industries, and a busy trade in grain. The church of Notre-Dame-du-Lac, with 13th century choir, has remarkable panelling and stalls in 17th century baroque style, and was damaged in the First Great War; that of S. Germain combines Romanesque and Gothic work. Pop. 20,662.

Tirnovó OR TRNOVO. Town and former capital of Bulgaria. It stands on the Yantra, N. of the Balkan Mts., on the rly. from Rustchuk to Stara Zagora, 60 m. S.E. of Plevna. It is the seat of a bishop, and has dye works and manufactures copper goods. Here in 1908 Prince Ferdinand declared the complete independence of the

country and assumed the title of king. Pop. 12,750.

Tiro, MARCUS TULLIUS (c. 95 B.C.-A.D. 5). Freedman and secretary of Cicero. He was himself an author, writing a work on grammar and a Life of his master, and he collected and edited Cicero's works. He was also credited with the invention of a system of shorthand, called Notae Tironianae.

Tirol OR TYROL. Western province of Austria. With an area of 4,886 sq. m., it lies between Bavaria on the N., Switzerland and Italy on the S., and has the Austrian provs. of Salzburg on the E. and Vorarlberg on the W. Before the First Great War the prov. extended S. to Lake Garda, but the treaty of Saint Germain-en-Laye gave S. Tirol or the Trentino (*q.v.*) to Italy.

Austrian Tirol comprises a series of Alpine ranges on the N. side of the main chain of the E. Alps. Between the Ötztal Alps and Hohe Tauern on the S. boundary to the Alps of Algau and the Bavarian Highlands on the N., a width of about 50 m., is the long, narrow valley of

the Inn, which rises in Switzerland and flows into Germany, flanked by minor ranges, the Stubai and Tuxer Alps. The Ötz, Ziller, and other small affluents flow through short, narrow valleys from the S. frontier, which is part of the water-parting between the drainage areas of the Adriatic Sea and the Danube. The N. boundary is crossed by the Lech and Isar, affluents of the Danube. The W. boundary is mountainous, communication is limited almost entirely to the Arlberg pass and rly. tunnel. Almost the only way S. into Italy is by the Brenner pass.

The rly. system centres on Innsbruck, the capital; lines go

E. by the Innthal to Salzburg, W. by the same valley to the Arlberg pass, S. to the Brenner, and N. to Bavaria. The main occupations are primary in character, lumbering in the extensive forests, cattle grazing and dairy farming on the Alps, and mining for lead near Landeck and for salt near Hall. Pop. 422,812.

In Roman times Tirol was part of the Roman Rhaetia which was conquered in 15 B.C. After being overrun by the barbarians it was cut up into a number of petty states; the German portion finally coming to the counts of the Adige or Tirol, from whom it passed to Austria in 1363. Ceded to Bavaria in 1805, Tirol was restored to Austria by the treaty of Paris in 1814. At the end of the Second Great War, 1945, Tirol came into the French zone of occupation in Austria. See Austria; Trentino.

Tirpitz, ALFRED FRIEDRICH VON (1849-1930). German sailor. Born at Küstrin, March 19, 1849, and educated at Frankfurt gymnasium, he entered the Prussian navy in 1865. He was Prussian minister for the navy from 1897 and in 1903 became grand admiral of the

German navy and head of the naval staff. The policy of Tirpitz was to compete with Great Britain in naval power and the mercantile marine, but scarcely to seek war. Here revolutionised the administration on board ship and worked out systems of defensive tactics and mass use of torpedo boats. When war came, Tirpitz tried to bring about a naval battle in which his big ships might be used advantageously, but he was blamed by Bethmann-Hollweg for neglect-



Tiridates II,
King of Parthia



A. F. von Tirpitz,
German sailor



Tirol. Three Tirolese peasants of this western province of Austria

ing the submarine, and this helped to cause his retirement in 1916. He thus had no responsibility for Jutland or the unrestricted submarine campaign. Tirpitz published his memoirs in 1919, founded the Fatherland party (hostile to Great Britain), and sat in the Reichstag from 1921. He died March 6, 1930.

Tirpitz. German battleship. A sister ship of the Bismarck (*q.v.*), she was laid down in 1936 and completed in 1941. Displacing 45,000 tons on a length of 792 ft. and a beam of 118 ft., she had a speed of 30 knots; she was armed with eight 15-in., twelve 5.9-in., and sixteen 4.1-in. guns, and carried four aircraft. She took part in the German invasion of Norway, where she remained for some time. Based on Alten Fjord, she came out to attack Allied convoys to Russia, so that her existence was a constant threat. On March 9, 1942, she was attacked by torpedo-carriers of the Fleet Air Arm, and thereafter was frequently damaged from sea and air. On Sept. 22, 1943, three midgeet submarines of the R.N. penetrated the boom defences in Alten Fjord and scored several torpedo hits, putting her out of action for months; on April 3, 1944, torpedo-bombers dropped 40 tons of H.E. on her; and on Nov. 12 a force of 29 R.A.F. Lancasters sank the Tirpitz in Tromsø Fjord, whither she had been removed, with 12,000-lb. bombs.

Tirupati. Town of Madras state, India. In Chittoor dist., it is 84 m. N.W. of Madras. On a hill 2,500 ft. high stands a pagoda which only Hindus may enter, with copper statues of Krishnaraja and his two queens, and an idol of Vishnu which attracts crowds of pilgrims. Pop. 19,500.

Tirupatur. Town of Madras state, India, in Vellore dist. It is situated W. of the Javadi Hills on the rly. from Madras to Calicut, and is an important road centre. It was taken by the British and recaptured by Haider Ali in 1767.

Tiruvannamalai. Town of Madras state, India, in Vellore dist. Situated in the S. of the dist. on the rly. from Vellore to Pondicherry, it occupies a strategic point where roads converge on the Chengama Pass through the E. Ghats. Between 1753 and 1791 it was besieged on ten occasions. A fire festival is held annually at the temple. Pop. 25,100.

Tiryns. Ancient Greek city of Argolis, in Peloponnesus. Accord-

ing to the legend, its walls were built for Proetus, king of Argos, by masons from Lycia in Asia Minor called Cyclopes, whence the term Cyclopean architecture. Like Mycenae (*q.v.*), Tiryns played no part in Greek history and was similarly destroyed by Argos (468 B.C.), but its archaeological remains are of the highest interest.

Tiryns was older than Mycenae, which may have been originally set up by the rulers of Tiryns as a barrier against invaders from the



Tiryns, Greece. Ruined walls of unhewn blocks of stone, which surround the ancient city. Top, one of the galleries in the southern walls

north. The acropolis was built on a rocky, oblong hill, some 50 ft. in height, on which were three terraces or platforms. The walls which surrounded it are still standing, and on the south side, where the hill is highest, Schliemann and Dörpfeld in 1804 discovered the ruins of a large palace, its walls covered with curious mural decorations, which in general structure exhibits a remarkable correspondence with the descriptions in the Homeric poems. It is distinguished, like later Greek dwelling-houses, by the separation of the chambers for men from those intended for females. A peculiarity of the surrounding walls is a number of galleries and chambers, probably store-rooms. See Aegean Civilization.

Tisa. Rumanian form of the name of the river described in this work under Theiss.

Tiselius, ARNE WILHELM KAURIN (b. 1902). Swedish biochemist, who in 1948 was awarded the Nobel prize for chemistry. Born Aug. 10, 1902, he took his doctorate in philosophy at Uppsala in 1931. There he worked as an independent professor on absorption analysis and the nature of serum proteins. In 1943 he was elected to the New York academy of science.

Tishri. Seventh month of the Jewish sacred year, and the first month of the civil year. It begins some time in Sept. or Oct. The first day of it is observed as Rosh Hashanah, or feast of the New Year; the Day of Atonement (Yom Kippur) is on the 10th; the feast



of Tabernacles, or harvest festival, on the 15th. See Calendar.

Tisio, BENVENUTO (1481-1559). Italian painter, commonly called Il Garofalo. Born at Ferrara, he studied there under Panetti and at Cremona; he also worked in Rome and Mantua. He returned home in 1501, and was associated with the brothers Dossi in paintings for the Borgias' court. He was again at Rome in 1509, when he came under the influence of Raphael, but in 1512 he appears to have settled at Ferrara. Blind from 1550, he died on Sept. 6 or 16, 1559. Good examples of his art are in the National Gallery, London, but most are at Ferrara and Rome.

Tiso, JOSEF (1887-1947). Slovak politician. He was ordained priest in 1909, and became a professor of theology. After the First Great War he joined the movement for Slovak autonomy and was a leading figure in the fascist Hlinka guard. When his people were granted self-government as a result of the Munich pact, 1938, he became prime minister; removed from office, he was reinstated by the Germans, and on Slovakia's being declared independent he was elected first president, Oct. 26, 1939. During the Second Great War Father Tiso allied himself with the Germans, repressed socialists, and helped to quell partisan revolts. Arrested by U.S. troops, 1945, he was imprisoned as a traitor by the reconstituted Czechoslovak govt., tried at Bratislava, found guilty, and hanged on April 18, 1947.

Tissaphernes (d. 395 B.C.). Persian satrap. In 414 B.C. he was made satrap of Lower Asia. During the latter part of the Peloponnesian War he toyed with the Spartans by holding out promises of help, his real policy being to let both the Athenians and the Spartans wear themselves out. After the battle of Cunaxa, 401 B.C., where he was one of the four generals of Artaxerxes, he treacherously murdered the leaders of the 10,000 Greeks. From 400 to 395, as governor of the coast of Asia Minor, he carried on war with the Spartans, but his failure caused Artaxerxes to give orders for his execution. See Cyrus the Younger; Xenophon.

Tissot, JAMES JOSEPH JACQUES (1836-1902). French painter. Born at Nantes, Oct. 15, 1836, he studied under Flandrin and Lamothe.



James Tissot,
French painter

His early years during which he painted mostly contemporary genre, were passed in Paris; but after the Franco-Prussian War he removed to London, where he produced clever etchings in the studio of Seymour Haden, and worked as a portraitist and caricaturist. His paintings of English social life in the '70s are of documentary interest. In the midst of his career he suddenly abandoned all secular art in order to devote himself to illustrating the life of Christ. About 1884 he set out for Palestine to collect materials for this work. Returning to Paris in 1895, he exhibited some 350 water-colour drawings of N.T. subjects marked by over-scrupulous historical realism. They were shown in London and published in Paris. Tissot was engaged in France on a set of O.T. drawings when he died, Aug. 8, 1902. Consult Vulgar Society, J. Laver, 1936. Pron. Tisso.

Tissue. In biology, aggregation of cells which have common origin and function. Thus the muscles of animals consist of cells making up muscular tissue, the brain and nerves of nerve tissue, the soft parts of plants of ground tissue, the veins of leaves of vascular tissue, and so on. Each tissue consists of one or more kinds of cell structurally suited to perform its relevant function.

Tisza. Hungarian name for the river referred to under its German name Theiss in this work.



Tit. Five species of the small British bird. 1. Black-headed marsh tit. 2. Great tit or ox-eye. 3. Little long-tailed species. 4. The rare bearded tit. 5. Blue tit on a broken cocoon
W. S. Berridge, F.Z.S.

TIT OR TITMOUSE. Family of small, rather long-tailed, arboreal birds (Paridae), of which seven species occur in Great Britain. Of these, the blue tit (*Parus caeruleus*), often called the tomtit, is the best known, a little bird measuring 4½ ins. in length, with a blue crown, white cheeks, greenish back, blue wings and tail, and a white breast crossed by a blue line. It is found in most parts of the British Isles, and is a familiar visitor to gardens.

The bearded tit (*Panurus biarmicus*) is extremely rare, and occurs only in the neighbourhood of the Norfolk Broads. It is 6½ ins. long, and has light brown plumage with a little black and white. The head is bluish grey, and from each cheek grows a tuft of black feathers from which the bird derives its name. It is found among beds of reeds, where it climbs about like a small parrot. The long-tailed tit (*Aegithalos caudatus*) is one of the smallest British birds. The plumage is in the main black and white, with slight tinges of red. It occurs freely in England and Ireland, but is not common in Scotland. It is found in woods and generally goes in small parties, visiting hedges and trees in search of insects. The nest is domed and made of felted hair, moss and lichens, lined with feathers. Over two thousand feathers have been found in a single nest.

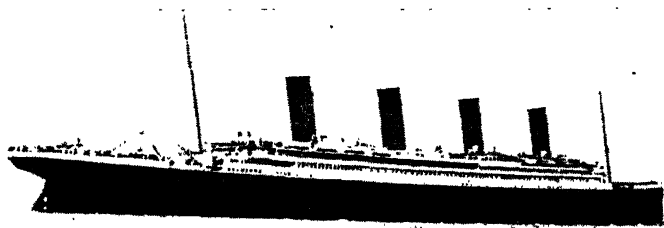
The great tit (*Parus major*), or ox-eye, has a black head and throat, greenish back, white cheeks, and

yellow under parts, and is 6 ins. long. It occurs locally in woods and orchards, but is nowhere abundant. It feeds mainly on insects, but has a distinct liking for carrion.

The marsh tit (*P. palustris*) has a black head, grey wings and back, with white cheeks, throat, and breast. It is common in England, rare in Scotland, and absent from Ireland. The crested tit (*P. cristatus*) is distinguished by its pointed crest of black and white feathers. The cheeks are white, the throat black, the under parts white, and the rest of the plumage reddish brown. It is extremely rare, being found only in certain pine forests in the N. of Scotland. See Coal Tit; Eggs, colour plate.

Titaghur. Town of W. Bengal, India, in the dist. of the 24 Parganas. It is situated on the Hooghli, 14 m. N. of Calcutta, and has paper and jute mills employing most of its 57,416 inhabitants.

Titan. Sixth Saturnian moon in point of distance from the planet. It was the first to be discovered, being detected by Huygens, March 25, 1655. Its diameter is a little under 3,000 m., exact estimate being difficult owing to irradiation. It varies slightly in brightness between the 8th and 9th magnitudes, and it is believed that its period of rotation is equal to its period of revolution about the planet, 15 days 22 hours 41 mins. Photo-



Titanic. The White Star liner, the largest vessel of her time, as she appeared before her maiden voyage to New York, during which she sank with the loss of over a thousand lives

graphy of the spectra of Titan proved that its atmosphere contains methane and ammonia.

Titan. In Greek mythology, a family of giants, the progeny of Uranus and Ge. They were 12 or 13 in number, and the best known are Oceanus, Hyperion, Cronos, Rhea, and Themis. At the instigation of their mother, Ge, the Titans rose against their father, Uranus, mutilated him, and made Cronos ruler of the universe in his stead. When Zeus became king of the gods the Titans refused to acknowledge his authority and carried on a 10 years' struggle with him.

Titania. Queen of the Fairies, in Shakespeare's play *A Midsummer Night's Dream* (q.v.). Wife of Oberon, she has quarrelled with him over possession of an Indian page. In revenge he casts a spell over her while she sleeps which compels her to fall in love with Bottom the weaver, after Puck has given him an ass's head. The healing of the quarrel and Titania's restoration to Oberon's affection is one of the charming themes of the play. See Bottom.

Titanic. British steamship sunk in the Atlantic, April 15, 1912. Belonging to the White Star Line, she was at the time the largest ship in the world and reputed unsinkable. Her details were: length, 852 ft.; beam, 92.6 ft.; gross tonnage, 46,328; engines, 70,000 i.h.p.; and speed, 21 knots. While on her maiden voyage from Southampton to New York the Titanic collided with a sunken iceberg. She struck this at 11.40 p.m. on April 14, 1912, and sank in a calm sea at 2.20 a.m., more than 1,500 lives being lost. Among those who perished were W. T. Stead, Jacques Futelle, the French novelist, J. J. Astor, and G. D. Widener. The Carpathia, reversing her course in response to the wireless signals of distress, picked up about 700 survivors. An inquiry into the disaster was held in London the same year, presided over by Viscount Mersey (q.v.), as the result of which several improvements in life-saving appli-

ances at sea were introduced, and the insistence upon routine boat drill on all passenger ships dates from this inquiry. Consult The Sinking of the Titanic, L. H. Beesley, 1912. An early British talking film, Atlantic, was based on the Titanic disaster, and Noel Coward placed one of the scenes of his play *Cavalcade* on the deck of the Titanic just before the disaster.

Titanite or **SPHENE.** A silicate of calcium and titanium, CaTiSiO_6 , occurring in lozenge-shaped crystals or grains. It is usually found as an accessory constituent of acid igneous rocks, sometimes in important amounts in lime-rich rock.

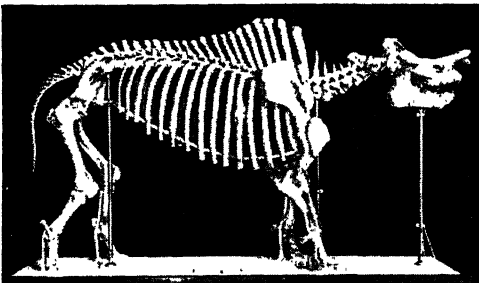
Titanium. Chemical element. Its symbol is Ti; atomic number, 22; atomic weight, 47.90; specific gravity, 4.5; m. p., 1,800° C. It has a hexagonal close-packed structure. This metal was discovered by Gregor in 1789 in a sample of Cornish iron ore. Although often regarded as rare, it is one of the nine most abundant elements in the earth's crust. It

from Travançore and Norway; both these ores can be brought into solution by fusion with alkali and extraction of the melt with acid.

Metallic titanium is prepared only with difficulty because of its high m. p., and the ease with which it combines with oxygen, nitrogen, carbon, and hydrogen, and with other metals to form alloys. Reduction of the tetrachloride with sodium in a sealed bomb at red heat gives a product containing a trace of iron but no other detectable impurity. Amorphous titanium is a dark grey powder. In the massive state it is bright and sufficiently hard to scratch quartz. It is stable in the air but when heated in oxygen at 600° C. it burns with a brilliant flame to form the dioxide TiO_2 , and at 800° C. it begins to burn in nitrogen to form the nitride TiN . It is the only element known to burn vigorously in nitrogen. It combines directly with the halogens and most other non-metals.

Titanium forms three series of salts corresponding to valencies 4, 3, and 2. Compounds are used in electric arcs, as mordants for dyeing, and for ceramic colours. The trichloride is a powerful reducing agent in the laboratory, and the tetrachloride produces artificial smoke screens. The dioxide is a paint pigment, being unaffected by sulphides. Addition of titanium to steel is usually in the form of ferro-titanium, made by reducing ilmenite or rutile in the presence of iron in an electric furnace. As there is high resistance to shock, such steel is used for rails.

Titanotheres (Gr. *Titan*, giant; *thēr*, wild beast). Extinct fossil family of ungulates resembling rhinoceroses. The animals, which



is found as the oxide, which occurs in three different crystalline forms, rutile, brookite, and anatase. It is also found as ilmenite, FeTiO_3 , and as titanates of iron, calcium, aluminium, etc. Commercial sources are rutile and ilmenite



Titanotheres. Reconstruction of a specimen of the *Teleoceras* genus; top, left, skeleton of *Brontotherium gigas*, member of another genus

American Museum of Natural History

flourished in the Oligocene (*q.v.*), had bony growths on the maxillary bones above the snout.

Tit-Bits. London weekly paper. First of a long succession of periodicals designed to amuse and instruct, it was established, Oct. 30, 1881, by (Sir) George Newnes (*q.v.*). An instant success, it was the first paper to insure purchasers against rly. accidents. Its first serious rival was *Answers* (*q.v.*).

Tithe (*A.S. teolha*, a tenth). Originally the tenth part of an income payable for the maintenance of the parish priest. The practice was commanded by Moses, but seems not to have been continued by Christians of the Apostolic Age. In Great Britain the earliest record of tithes seems to be that of Bede. In 750 Egbert, archbishop of York, directed his clergy to teach their people to pay tithes.

to the average price of corn during the preceding seven years, this being periodically determined by rather involved tables.

Changes in prices during the First Great War caused much inconvenience, and in 1918 tithe rent charge was fixed for the seven years to 1925. In the latter year provision was made for its extinction in 85 years, by a sinking fund. This was considered inadequate, and in 1936 the charge was abolished, the owners receiving compensation in the form of govt. stock, while those liable to pay were required to contribute to a redemption annuity for 60 years. The amount of the redemption annuity is far less than that of the former tithe rent charge.

Tithe Barn. Medieval storehouse for grain and fodder payable to the church in kind. Usually

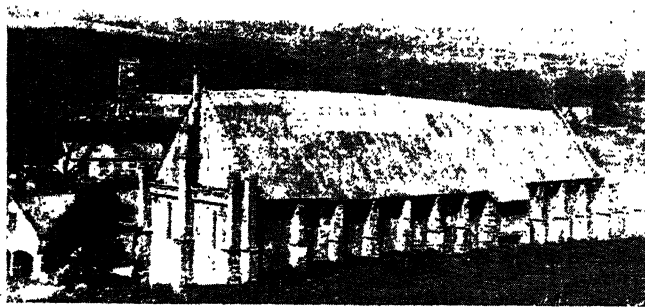
Tithing. In old English law, a group of ten householders and their dependents regarded as acting together for purposes of ensuring peace and good behaviour under a system of frankpledge (*q.v.*). The individual members of a tithing were held as surety for the good conduct of the others. The chief of the unit was known as the tithingman, a title used for an elected police official in the early New England colonies. See *Hundred*.

Tithonus. In Greek mythology, the son of Laomedon, king of Troy, by a river nymph. The goddess Eos or Aurora fell in love with him, and he begot by her the hero Memnon. Tithonus begged of Eos to give him immortality, but forgot to ask for perpetual youth, so that although the goddess granted his request, the older he grew, the more decrepit he became. Eventually, he begged Eos to revoke her gift, and the goddess changed him into a grasshopper. Tennyson wrote a poem called *Tithonus*.

Titian. Anglicised form of the name Tiziano Vecelli (d. 1576), Italian painter. He was born at Pieve, of an old family in the district of Cadore; but the date of his birth has been disputed, different authorities giving it as 1477 and 1489. He learned painting in Venice, probably at first with Zaccato, a worker in mosaic. He then studied under Gentile Bellini, eventually attaching himself to Giorgione, whose sense of glorious colouring and of romance he shared.

By the time Giorgione died at 32, Titian had become a great name in Venice. One of his earliest allegorical compositions, *Sacred and Profane Love*, exemplifies his skill as a colourist, and strength in composition. In 1513 he applied to the council in Venice to be made their official painter, and three years later obtained his request. From that time he was the supreme head of the Venetian school.

The greater part of his life was spent in Venice, but he was well-known at Ferrara, Mantua, Bologna, Augsburg, and Milan, his work being in great demand, and members of the imperial court sending for him to carry out their commissions. In 1545 he was in Rome, carrying out commissions for Pope Paul III, and while he was there he made the acquaintance of Michelangelo. Returning to Augsburg he produced the por-



Tithe Barn. A fifteenth century example preserved among the ruins of a Benedictine abbey at Abbotsbury, Dorset

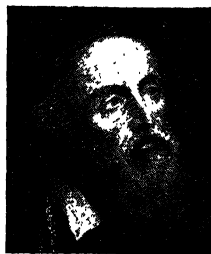
These were of three kinds: predial tithes, the produce of the soil; personal tithes, the profits of handicraft or merchandise; and mixed tithes, often included in predial tithes, the produce of animals, including butter and eggs.

Where the income from tithes was more than sufficient for local needs, tithes were often appropriated to cathedrals and monasteries. The greater tithes appropriated to monasteries often found their way into secular hands, as is shown by the existence today of lay vicars and rectors. With the rise of nonconformity in the 18th and 19th centuries there arose an agitation against the payment of tithes, and, refusing to pay, many persons were imprisoned.

By the Tithe Commutation Act of 1836, and subsequent amending Acts, tithes were replaced by an annual rent charge. The par value of tithes was fixed according to their amount at the time, and on the assumption that a certain number of bushels of corn were worth £100. But the real value was to vary each year, according

to the average price of corn during the preceding seven years, this being periodically determined by rather involved tables. Outstanding English examples connected with abbey foundations are at Bradford-on-Avon, Tisbury, and Glastonbury. That at Frocester, Glos, is 184 ft. long. Parochial tithe barns were as a rule smaller.

Titherage, MADGE (b. 1887), British actress. Born in Melbourne, Australia, July 2, 1887, she was educated in England, and made her London debut in *The Water Babies* at the Garrick Theatre, 1902. She joined Lewis Waller's co. in 1908, and in 1911 became a star by her performances in *A Butterfly on the Wheel*. In 1912 she first played on the New York stage. Excelling in comedy, she was at her best in *Bluebeard's Eighth Wife*, 1922; *The Queen Was in the Parlour*, 1926; *Theatre Royal*, 1934; and *Mademoiselle*, 1936.



Titian, Italian painter
Self-portrait at Windsor

trait of Charles V, now at the Prado, one of the noblest works of the 16th century. He also painted several portraits of Philip II of Spain. Titian died of plague, Aug. 27, 1576.

Titian's art is the highest perfection of sensuous beauty, not of spiritual loveliness nor of intellectual mysticism; frankly materialistic, frankly decorative. His work is the high-water mark of superb colour, and as a portrait painter he is usually regarded as in certain respects the greatest of all times, not equal to Velazquez in his magnificent evidence of truth, but superior to him in grandeur of style and in sumptuousness of colouring. His work can best be studied in Venice and Madrid.

The Louvre also possesses many works by Titian, and others of almost equal importance have been permanently exhibited in Florence, Dresden, the Villa Borghese, Rome, and Vienna, while almost all the galleries of Europe, such as those of Milan, Munich, Leningrad, London, and Antwerp, contain fine examples by his hand. See Aretino, P.; Ariosto, L.; Clement VII.; Jesus; Medici; Philip II; Pole, Reginald.

Bibliography. Life and Times of Titian, J. A. Crowe and G. B. Cavalcaselle, 1887; Earlier and Later Work of Titian, Sir C. Phillips, 1897-98; Titian's Drawings, D. V. Haden, 1927.

Titicaca. Largest lake of S. America. It lies on the boundaries of Peru and Bolivia, between the main Andean range and the Cordillera Real, at an alt. of 12,500 ft. It has a length of 130 m. from N.W. to S.E., an average width of 40 m., a depth in places of over 800 ft., and an est. area of 3,200 sq. m., being the loftiest lake of its size in the world. Its shores are indented by numerous bays, and there are many projecting promontories. It is fed by the Lagun-

illas and the Asangaro on the N. shore, and is drained from the S. end by the Desaguadero (*q.v.*), which flows to Lake Aullagas. This is now the only outlet of the lake, which is said to have formerly occupied a far larger area. There is steamboat communication between the towns of Puno, Juli, and Chucuito, the former being connected with Mollendo on the Pacific slope.

Titlark (*Anthus pratensis*). Name sometimes applied to the meadow pipit (*q.v.*), a common British bird.

Title. In general, an appellation or name. Derived from Lat. *titulus*, an inscription on an altar or tomb, the word came to mean a distinguishing inscription, and hence an appellation of dignity given to persons, as well as retaining its original sense as an explanatory inscription, *e.g.* the title of a book or picture. It is also used in connexion with the ordination of deacons and priests in the Church of England; such must have a title, *i.e.* a promise of a curacy or living, before being admitted to ordination.

Titles are borne by persons holding high office or hereditary dignities and positions, and are generally divided into hereditary and non-hereditary. The hereditary titles in the peerage of the U.K. are duke, marquess, earl, viscount, and baron. Courtesy titles are borne in Great Britain by children of peers, *e.g.* the eldest son of a duke, marquess, and earl is called by his father's second title. See Address, Forms of; Aristocracy; Baron; Baronet; Duke; Earl; Esquire; Knight; Peerage; Precedence; Rank.

Title. In English law, the right of ownership, especially in regard to property in land. The purchaser of such must see that his title to the property is a good one, *i.e.* that he cannot be molested in its possession. To secure this, various

documents are examined and further documents conveying the land are drawn up. Registration of title to land by the state was introduced under the Land Registration Act, 1925.

Title deeds embrace all those deeds and documents by which the owner proves his ownership, a mortgagee his mortgage, a lessee his lease, and the like. The Larceny Act, 1916, makes it a felony for anyone, with fraudulent intent, to destroy, obliterate, cancel, or alter any document of title to land. See Conveyancing; Land Laws; Land Registration.

Tito. This is the name assumed by Josip Broz (b. 1890), Yugoslav soldier and statesman. Son of a village blacksmith, he was born of Croat and Czech parentage at Kumrovec, near Zagreb, then in the Austro-Hungarian empire. He grew up amid national and social



Marshal Tito,
Yugoslav soldier and
statesman

discontent, served in the First Great War, was a prisoner of the Russians during 1915-17, joined the Red Army, fought against anti-Communist forces, and returned to newly created Yugoslavia to organize the Communist party there. Repeatedly arrested, he was sentenced to six years' imprisonment in 1928, and on release went to Moscow, helping to arrange the transport to Spain of volunteers joining the international brigades.

Secretary-general of the Yugoslav Communists from 1937, Broz inspired and led guerrilla forces against the Germans in the Second Great War, beginning his campaign in Bosnia. In 1942 he first used the pseudonym Tito, becoming president, 1943, of the new national liberation council, and c.-in-c. of the people's army of liberation with the rank of marshal. He was recognized Dec. 22, 1943, as a full Allied commander. He refused to agree to the return of King Peter II until after the holding of an election. This, held in Nov., 1945, gave Tito an overwhelming victory and led to the proclamation of a republic. Expulsion of Yugoslavia from the Cominform in 1948 failed to affect his policy, or his hold on his country. Consult Whirlwind, S. Clissold, 1949; Eastern Approaches, F. Maclean, 1949.



Titicaca. View of the largest lake in S. America, on the boundaries of Peru and Bolivia, showing the Island of the Moon

Titograd. Name given in 1948 in honour of Marshal Tito to the Yugoslav town Podgorica (*q.v.*).

Titration (Fr. *titre*, standard). Method of chemical analysis. It consists in ascertaining the strength of a chemical substance by noting the quantity of a solution of known strength that is required to complete a definite chemical reaction. The reaction may, for instance, be the neutralising of an alkaline solution by an acid; the formation of a precipitate, as in titrating sodium chloride by a standard solution of silver nitrate, or by oxidation and reduction methods, as in the estimation of an iron salt by means of a solution of potassium permanganate.

Sometimes, to render the final reaction visible, an indicator is used. The estimation of an acid or alkali requires litmus or phenolphthalein to indicate by change of colour the state of the liquid—whether acid or alkaline. The indicator used in the analysis of iodine solutions is starch-paste, which turns blue when there is free iodine present. It may happen also that the end point of the reaction is indicated by an incipient precipitate, as in the titration of hydrocyanic acid by means of silver nitrate.

Titulescu, NICOLAS (1883–1941). Rumanian statesman. He was born at Craiova, became a barrister and in 1905 professor of civil law at Bukarest, and entered parliament, 1913. A Liberal, he was minister of finance in 1917, helped to carry through agrarian reforms, and in 1921 introduced income tax. He was a principal architect of agreements with Czecho-Slovakia and Yugoslavia by which those countries and Rumania formed the Little Entente. For most of the period 1922–32 Titulescu was ambassador to London. A strong supporter of the League of Nations, determined to resist Italian encroachment in the Balkans, he incurred the hostility of the Iron Guard and other pro-fascist groups while foreign minister from 1932. Long sojourns in W. Europe weakened his prestige at home, and he was removed from office in 1936. He died at Cannes, March 3, 1941.

Titus. Companion of S. Paul. A Greek by birth, and perhaps converted by the apostle in Asia Minor, he is first mentioned as accompanying him from Antioch to Jerusalem, where a church council, which discussed the position of Gentile Christians, decided that he need not be circumcised

(Gal. 2, v. 1). On three occasions he was working in Corinth. S. Paul, who addressed a short epistle to Titus, left him in Crete, where he had charge of the Church, apparently as its first bishop. He was with S. Paul in his second imprisonment at Rome (2 Tim. 4, v. 10). See Paul, S.

Titus, FLAVIUS SABINUS VESPASIANUS (40–81). Roman emperor, 79–81. Eldest son of Vespasian,



Titus,
Roman emperor

he was born in Rome, Dec. 30, 40, received an excellent education, and served as military tribune in Britain and Germany. During the war with the Jews he took command after his father had returned to Italy, and ended the war by taking the Temple of Jerusalem in 70. More than a million Jews were said to have perished in this terrible siege and 100,000 to have been sold into slavery. This campaign of Titus is celebrated by the arch at Rome which bears his name. When he succeeded his father, he proved in his short reign to be one of the most popular emperors, and exerted himself nobly to relieve suffering after the disaster at Pompeii. Titus died at his Sabine villa, Sept. 13, 81. See Colosseum.

Titus Andronicus. Tragedy by Shakespeare. The hero of this name, a mythical Roman general who has defeated the Goths, sacrifices the first-born son of Tamora, their queen.

secures the mutilation of Titus and his daughter and the beheading of two of his sons. Titus bakes the heads of two of Tamora's sons in a pasty, serves them up for her to eat, stabs her and his daughter, is stabbed himself, but avenged on the instant by his surviving son, the play ending in a carnival of slaughter. First acted and printed anonymously in 1594, mentioned by Meres, 1598, and included in the 1623 folio, the play appears to have been based on Titus and Vespasian, probably by Kyd, with some aid from Greene or Peele, and acted in London

in 1591. Usually considered too crude for revival, it contains 2,525 lines, including 2,328 of blank verse. *Consuli* Did Shakespeare Write Titus Andronicus?, J. M. Robertson, 1905.

Titios. In Greek mythology, a giant who attempted to offer violence to the goddess Artemis. For this he was killed by Apollo, brother of Artemis, or, according to others, by Zeus. Consigned to Tartarus, he lay on the ground, covering nine acres, with two vultures perpetually tearing his liver.

Tiverton. Mun. bor. of Devon, England. It is situated where the Lowman joins the Exe, 14 m. N. of Exeter, and is a rly. junction. The town lies on both sides of the rivers, which are here spanned by stone bridges. S. Peter's church has fine brasses and other monuments, and a doorway of the original Norman building. The castle, which dates from about 1100, has been largely rebuilt. Here is Blundell's school (*q.v.*); also grammar schools and technical schools for boys and girls. The industries include the manufacture of lace, flour, and beer, and there is a trade in agricultural produce. The bor. had its own M.P. 1618–1885; it now gives its name to a co. constituency. In the 16th and 17th centuries it was noted for its woollen goods, especially Tiverton kerseys. Pop. est. 11,000.

Tivoli (anc. Tibur). City of Italy, in the prov. of Rome. One of the most ancient towns of Latium, it is said to have been founded by the Siculi. Situated on a slope of the Sabine Hills, 25 m. by rly. E.N.E. of Rome,



Tivoli, Italy. General view of the Sabine town, showing the waterfalls of the Anio



Tivoli, Italy. The graceful Temple of Vesta, on a rock overhanging the falls

on a rocky eminence 750 ft. high, by which flows the river Teverone (Anio), Tivoli has been a celebrated summer resort from antiquity. The chief Roman remains are the beautiful circular Temple of Vesta; the temple of the Sibyl; the villas of Hadrian and Maecenas; and mausoleums, aqueducts, baths, etc. The Villa d'Este, part of which was demolished by a direct hit during the Second Great War, dates from 1549. The castle of Pius III, built about 1460, is now a prison. The falls of the Anio, 350 ft., supply electric power for Rome. French troops of the Allied 5th army captured Tivoli June 5, 1944. See Este; Hadrian's Villa.

Tizard, SIR HENRY THOMAS (b. 1885). British scientist. He was born Aug. 23, 1885, and educated at Westminster and Magdalen College, Oxford. While a Fellow of Oriel (1911-21) he was seconded for duty with the R.F.C., later R.A.F., being assistant controller of research, 1918-19. During 1927-29 he was permanent secretary to the dept. of scientific and industrial research, and then successively rector of the Imperial College of Science, 1929-42, and president of Magdalen until 1946. Knighted in 1937, Sir Henry acted as chairman of the aeronautical research committee in 1933-43, and with Sir R. Watson-Watt stimulated research on radar in Great Britain. The govt.'s chief scientific adviser on defence, he was in 1948 president of the British Association.

Tlaloc. Ancient Mexican deity. The god of rain and thunder, he was said to inhabit the snow-clad range dominated by Popocatepetl.

Tlaxcala. Smallest state of Mexico. It lies E. of the state of Mexico and covers an area of 1,555 sq. m. Its surface has a general elevation of about 7,000 ft., and reaches an alt. of 13,480 ft. in Malinche. Pop. 224,063.

Tlaxcala. Town of Mexico, capital of the state of Tlaxcala. It

is situated at about 7,350 ft. alt., and is 60 m. by rly. E. of Mexico City. Its chief features are the state-house, the old bishop's palace, and remains of the ancient Indian capital. A trade in grain and hides is carried on.

Tlemcen. Town of Algeria. In the Oran div., it is 68 m. from Oran on the rly. from Oran to Morocco. The Pomaria of the Romans, it was occupied by the French in 1842. It exports olive oil, alfa, and blankets. It contains many relics of the time when the city was the Moorish capital of North-West Africa, and occupied a high place in Arabic culture. There are many fine mosques dating from the 12th-13th centuries, some ornamented with rich sculpture and carving; a fortress where the Moorish sultans formerly lived; and a museum of local antiquities which contains the epitaph of Boabdil, king of Granada, and the standard cubit measure of Mahomedan commerce. Pop. 71,400.

Tlingit. American Indian tribal stock. They are found on the S.E. coast of Alaska, having migrated from a region farther S. A tall, brown, talented people, they have acquired from their Eskimo neighbours bone spear-throwers and lip-ornaments, while their skillfully carved timber houses and canoes, hot-stone cookers, and other cultural elements point to ultimate Polynesian contact.

Toad (*Bufo*). Large genus—over 100 species—of batrachians, of world-wide distribution, with the exception of Australia and Madagascar; most abundant in tropical America and the Indo-Malayan region. Closely related to the frogs (*Rana*), they differ from them in their flatter upper side, broader head, shorter limbs, and in the skin being very dry and pimply, with glands which secrete an acrid fluid. In addition, the toads are toothless, and the tip of the tongue

is not divided. They pass through a larval ("tadpole") stage similar to that of the frog, but the eggs, which vary from 700 to 2,000, are extruded in a double chain enclosed in a string of jelly, which is wound around water plants. The tadpoles are smaller and darker than those of the frog. The genus is represented in Great Britain by two species; the common toad (*B. vulgaris*) and the natterjack (*B. calamita*); but the former does not occur in Ireland.

The common species has on its upper side some tint of brown or grey, varying with its surroundings; and the under parts are whitish, more or less spotted with



Toad. Common species, *Bufo vulgaris*, found in all parts of Britain

black. It seeks drier situations than the frog, and is inactive during the day, coming abroad in the dusk and feeding upon insects, worms, and snails: large individuals on occasion catching small mice. One toad will in a night's foraging consume vast numbers of insects, so that its cooperation is always to be encouraged by gardeners. From ancient days the toad has been the subject of numerous erroneous beliefs, e.g. the possession of a jewel in its head, the power of ejecting venom, and of living for centuries entombed in solid stone or the heart of a tree. The toad hibernates, retiring in autumn to holes in dry ground or other suitable retreats, and on awakening in spring immediately seeks the ponds or ditches for mating and egg-laying. See Animal colour plate; Natterjack; Surinam Toad.

Toadflax (*Linaria*). Genus of herbs of the family Scrophulariaceae. Natives of Europe and W. Asia, the flowers are tubular, with a hollow spur, and the mouth is closed by lips, which can only be opened by strong insects, like bees. The best known species are the yellow toadflax (*L. vulgaris*) and the ivy-leaved toadflax (*L. cymbalaria*). The first named is com-



Toadflax. Clustered flowers and leaves of *Linaria vulgaris*

mon in dry wastes, and the dense clusters of bright yellow flowers are similar to those of the snapdragon. *L. cymbalaria* trails down over old walls, and has slender branches, lobed, kidney-shaped leaves, and small blue-purple flowers.

Toadstool. Term popularly applied to mushroom-shaped fungi to indicate their supposed poisonous character. As a matter of fact, very few of this order of fungi (the Hymenomycetaceae) are known positively to be poisonous, and a fair percentage are known to be as wholesome as the common mushroom (*Psalliota campestris*). See Amanita; Blewits; Botany; Flyagaric; Fungus; Mushroom.

Toala. Aboriginal tribe in S.W. Celebes, Indonesia. They are a medium-headed, wavy-haired, thick-lipped people, short, dark, and slender; they represent a primitive caucasoid type allied to the Vedda and Sakai, with Melanesian elements. Inhabiting rock-shelters, they are hunters, using stone knives and arrow-heads, and bone lance-heads and whistles.

Toast (Lat. *tostus*, scorched). Bread dried and browned before a fire. When bread is exposed to heat the surface becomes caramelised, and the starch transformed into dextrin. Toast is therefore beneficial to people who are unable to eat much starchy food, especially if the bread is cut very thin and toasted slowly till it is hard throughout. See Bread.

Toast. Term used for drinking a health and for the health drunk; it was originally applied only to a lady, who was known as "a toast." This use of the word is usually referred to the story of a gallant at Bath in the reign of Charles II, who, seeing an admirer of a famous beauty drinking her health in a glass of the water in which she was standing, threatened to plunge into the bath, vowing that, "though he liked not the liquor, he would have the toast," in allusion to the old custom of putting toast in a glass of wine to improve the flavour. See Health; King over the Water.

Toastmaster. Official at public banquets who announces the healths. A stentorian voice is essential, and toastmasters are usually selected from those officials of such institutions as Lloyd's whose duty it is to "call" members. A toastmaster should be fully acquainted with the order of precedence and styles of address.

Toba. South American Indian tribe in the Gran Chaco, N. Argentina. Of Guaycuru stock, they are

tall and muscular, hostile to whites, superb horsemen, and use spears for fishing. They wear paint and feather-ornament rather than clothing.

Tobacco (Sp. *tobaco*). Popular name for plants of the species *Nicotiana* (family Solanaceae), and for the narcotic prepared from certain species for smoking. The Spanish word *tobaco* came from *tobago*, native name of the Y-shaped stick used for inhaling smoke through the nostrils by the ancient Carib inhabitants of what is now the Dominican republic. Columbus noted the smoking of the *tobago* in 1492. Incense made from tobacco leaves and blown from a type of pipe was used in their religious ceremonies by the Maya, and burial mounds found in the Mississippi valley, and believed to date from 700, contained smoking pipes.

Francesco Fernandez, a physician, introduced the tobacco plant into Europe in 1558, when he brought plants to Philip II of Spain. In 1561 Jean Nicot (*q.v.*) presented Catherine de' Medici with tobacco plants grown from seed which he had acquired while ambassador to Portugal. Both Fernandez and Nicot were interested in the use of tobacco medicinally as snuff, for poultices, etc., and it was from England that the custom of smoking spread to the Continent. Ralph Lane, first governor of Virginia, was the first person to introduce tobacco in quantity into England, and Raleigh made smoking popular.

At that time tobacco was believed to be a remedy for indigestion, scurvy, and gout, and a cure for the disease of horses called the staggers. It was supposed also to ward off the plague, and it is recorded that boys at Eton college were whipped for failing to smoke their morning pipes. James I of England, however, was an opponent of smoking, and not only published his Counterblaste to Tobacco but also raised the duty on imported tobacco from 2d. to 6s. 10d. a lb., and prohibited its growth in England. Louis XIII prohibited the sale of tobacco in France except on the order of a physician; Pope Urban VIII issued a bull excommunicating all who took it into church.

Charles II maintained the prohibition on the growth of tobacco in England to keep up import duties, and this prohibition contributed much to the early prosperity of tobacco growers in America. During the War of

Independence tobacco could not be imported from Virginia and was again cultivated in England, but the law prohibiting it had not been repealed, and the enterprising planters were fined £30,000 and sent to jail, while their crops were publicly burned by the hangman. Tobacco grown in Scotland, which did not come under the Act, was forcibly bought by the govt. at 4d. per lb.

In 1886 the British govt. permitted experiments in tobacco growing, soon abandoned since the results were not very good, and the same duty was charged on home grown as on imported tobacco. Under the Finance Act, 1908, tobacco growing was permitted under licence from the commissioners of customs and excise. A tobacco dealer in the U.K. must be licensed.

There are more than 50 varieties of the tobacco plant, the three most commonly used in manufacture being: (1) *Nicotiana tabacum*, a native of central America or the West Indies, which bears pink or rose-coloured flowers and grows to 6 ft. or higher; (2) *Nicotiana rustica*, a smaller plant with yellow flowers which originated in Mexico and is now grown in Turkey and the Levant; (3) *Nicotiana Persica* (Persian tobacco), used for smoking in a hookah.

CULTIVATION. The seeds are sown in seed-beds, and the plants set out in the field when they are 6 to 8 ins. tall. In the northern hemisphere the seeds are sown from the beginning of Jan. to early in April, according to the lat., planting in the N. being later than in the S. The beds are carefully prepared, and are sterilised by burning wood over them or by steaming, and manured. The seed is very small—about 300,000 to one ounce; one ounce is usually sufficient for 100 sq. yds. of seed-bed. The seed is often sown with a pepper-pot, or by hand mixed with ashes, sand, etc.

In seven or eight weeks the plants are ready for transplanting by hand or by machine; they are set out on ridges from 2½ ft. to 4½ ft. apart, with 1 ft. to 3½ ft. between plants, according to type. Turkish tobacco is set closer than this. The closer the setting, the thinner will be the leaf. Plants of tobacco grown for cigars are usually set 12 ins.—18 ins. apart.

In two months the crop starts to flower, and the buds are pinched off, or "topped," to allow all the nutriment to go into

the remainder of the plant. For cigar and cigarette types from 15 to 20 leaves are left on the plant, for the heavy pipe varieties from 10 to 12 leaves. After topping, fresh shoots, called suckers, which appear in the axils of the leaves, are removed. In another month's time the leaves have turned from a dark to a lighter yellowish-green colour, and are then ready to be harvested by either priming or cutting. In priming, the leaves are picked individually from the stalk, starting with the lower leaves, which ripen first. About three leaves are taken off a plant at each priming. The bottom, or sand, leaves are in most types discarded. The leaves to be used are transported to the barn, where they are suspended from sticks, ready for curing. In cutting, used for the heavier types of pipe tobacco, where only 10 to 12 leaves remain on the stalk, the whole plant, as soon as the middle leaves have ripened, is cut down and split. After the leaves have been allowed to wilt for a short time in the field, the plants are removed to the barn where they are straddled across sticks, ready for curing.

The yield varies considerably, and may be as little as 600 lb. an acre, or as much as 1,500 lb.; 800–1,000 lb. per acre is probably average for most types of tobacco.

CURING. The three chief methods of curing are by air, fire, and flue. Air-curing is probably the original method, flue-curing is the most recent. All cigar tobaccos are air cured, i.e. are allowed to cure naturally by air. The plants or leaves normally take some wks. to dry, weather conditions at the time being the governing factor. When it is cured, the leaves of cut tobacco are stripped from the stem.

In fire-curing fires are lit under the suspended tobacco in the barn, the smoke usually effecting curing in a shorter time than without it. Fire-cured tobacco, which is darker in colour and has a fired smell, is used in stronger types of shag, roll, etc. Only varieties grown in certain districts of Kentucky, Tennessee, Virginia, and parts of the British Commonwealth, and cut, are cured in this way. Hickory, oak, and gum are the woods most commonly used for firing.

Flue-curing was introduced during the second half of the 19th cent. It produces the bright yellow-coloured tobacco used for cigarettes sold in Great Britain.

Most of the tobacco thus cured is primed. Heat from wood fires is conducted through flues running along the bottom of the barns, which are smaller than those used for air-curing. No smoke reaches the tobacco. In the first stage (yellowing) the heat is raised to about 110° F. for 24 to 36 hrs. In the next (fixing the colour) it is raised to about 135° F. for 10 to 18 hrs. In the last stage (killing the stem) the last of the sap is dried out of the stem at 170° F. to 180° F. The whole process takes four to five days, and considerable experience is necessary in determining the various temps. A more expensive method is to use oil burners; coal is sometimes used.

GRADING AND MANUFACTURE.

After the tobacco has been cured, the farmer takes it from the barn early in the morning, when it is slightly moist, and stacks it in his pack-house. It is then graded and tied into "hands"—10 to 15 leaves tied together with one leaf. Leaves of cigar tobaccos are placed in a bulk and artificially fermented. Turkish tobacco leaves, being small, are not tied in hands.

In the U.S.A. and some Commonwealth countries tobacco is sold in baskets or bales on the warehouse floor by auction to the manufacturers and dealers. In Canada, where there are no auctions, buyers bid direct to the farmer for the tobacco hanging in the barn. The tobacco is re-graded in re-drying factories and put into re-drying machines, in which it is dried, cooled, and "ordered" (i.e. put into condition for packing); the last process being done by steam. It is then packed into casks (or tierces) containing up to 900 lb., and shipped. Other packings used are

excise duty is paid. It may be manufactured into cigarettes, cigars, snuff, or pipe tobacco mixtures, e.g. flakes, shags, roll, twist, cut plugs, navy cuts, spun cuts. It is blended very carefully. Not only are the various types and grades blended together, but also the different crops, so that an even blend is maintained from year to year. In making snuff the leaf is ground, carefully fermented for some weeks, and flavoured to produce the greatest possible amount of free ammonia, free nicotine, and other aromatic scents.

PRODUCTION. The U.S.A. produces more than a million tons of tobacco a year, India more than 400,000 tons. Other large producers are China, Russia, Brazil (116,000 tons), Turkey (68,000), Canada (63,000), Greece (48,000), Cuba (38,000), Bulgaria (37,000), Indonesia (27,000), Argentina (26,000), S. Rhodesia (21,000), Mexico (14,000), Korea (14,000), Persia (12,000), S. Africa (10,000), Paraguay (10,000), Philippines (10,000).

Tobago. Island in the British W. Indies, included administratively with Trinidad. It lies 21 m. N.E. of Trinidad, has an area of 116 sq. m. and is 26 m. long and 7½ m. wide. Of volcanic formation, the conical hills and ridges do not rise higher than 1,800 ft. The cultivation of rubber, cotton, and tobacco is established, but the main exports of the island are copra and cocoa. Scarborough, on the S. coast, is the port and chief town. Discovered by Columbus in 1498, it was successively Dutch, British, and French, finally becoming British in 1814. Pop. 25,358, mainly negroes.

Tobermory. A seaport and parish of Argyllshire, Scotland. It stands on the bay of the same



Tobermory, Argyllshire. Harbour and quays of this fishing port

hogsheads (more than 900 lb.), cases and bales, 200–400 lb.

On arrival in the U.K. the tobacco is stored in bonded warehouses, where it matures for two to four years. When it is cleared from bond into the factory, the

name, 30 m. from Oban, and has a good harbour, protected by an island. The place was founded as a fishing station in 1788.

After the defeat of the Armada in 1588 a Spanish galleon, believed to be the *Almirante de Florencia*,

put into Tobermory Bay, but after an explosion sank about 80 yards from the shore, in about 66 ft. of water. The galleon was believed to contain treasure to the value of over £300,000, and to have gone down with about 350 officers and men. Having settled down into the sea-bed, she was covered by 20 ft. of silt. In 1912 salvage operations recovered silver goblets, dishes, and coins. Royal Navy divers in 1950 located the galleon and recovered a few medallions. The wreck belongs to the dukes of Argyll. *Consult* State Papers of Scotland, 1588.

Tobias. Character in the book of Tobit. He is chiefly remembered for the appearance to him of the angel Raphael (5, *vv.* 2-8), an incident which was treated flippantly in James Bridie's play *Tobias* and the Angel, 1931. Of Hebrew origin, the name means God is good, and is used as a Christian name.

Tobit, Book of. One of the O.T. Apocrypha, composed probably by an Egyptian Jew in Aramaic towards the end of the 3rd century B.C. It is a kind of religious romance recounting the adventures of a pious Jew named Tobit, who with his wife Anna and his son Tobias (*v.s.*) had been carried captive to Nineveh by Shalmaneser. It has been suggested that the author was indebted to four main sources: the O.T., the Story of Ahikar, the fable of the Grateful Dead, and a tractate of the Egyptian god Khons of Thebes.

Tobogganing. A snow sport. The word represents the American Indian *odabaggan*, which was used by the Indians of N. America for transporting goods across the snow. The Canadian and American toboggan is a sled with a flat bottom, sometimes fitted with low iron runners from 4 to 8 ft. long and about 2 ft. wide, accommodating up to six persons. The runs, or

slides, in Canada and the U.S.A. down which the toboggans glide, are straight and divided into chutes or slides by low banked walls of snow, so that several toboggans can descend side by side without danger of collision.

The most modern form of tobogganing is obtained in the Engadine, Switzerland, during the winter season, notably on such runs as the Buol at Davos Platz and the Cresta at St. Moritz. The racing machines consist simply of round steel skeleton runners about 4 ft. long and 6 ins. high, with just a centre board on top along which the rider lies face downwards. Iron spikes are fixed to the toe of each boot, with which the tobogganist guides and brakes his machine.

On the Cresta the pace in places reaches nearly 70 m. per hour. The surface of the track is composed of compressed snow, over which water is thrown to make a glazed surface of ice. Bobsleighing is a simpler form of tobogganing. *See* Bobsleigh.

Tobol. River of W. Siberia. It rises in the Urals, and after a N.E. course of about 800 m., during more than half of which it is navigable, joins the Irtysh in the territory of Tobolsk. The river is frozen from Nov. to May at Kurgam, Tobolsk, and other places in the neighbourhood.

Tobolsk. Town of R.S.F.S.R., in the region of Omsk. It is situated 500 m. N.W. of Omsk, at the confluence of the Irtysh with the Tobol. The inhabitants are mainly occupied in tanning, tallow and soap boiling, shipbuilding, match-making, distilling, and fishing. Nicholas II of Russia was imprisoned here after the revolution of 1917, and the town was the scene of considerable fighting in 1919 between the Bolsheviks and Koltchak's forces. Pop. est. 25,000.

Toboso, El. Town of Spain, in the prov. of Toledo. Situated in La Mancha, 12 m. N.E. of Alcázar de San Juan it was immortalised by Cervantes in Don Quixote as the dwelling-place of the peerless Dulcinea.

Tobruk (anc. Antipyrgos). Seaport of Cyrenaica. Occupied by the Italians Oct. 4, 1911, it is situated on the best harbour on the coast of Cyrenaica; indeed one of the best on the Mediterranean. The harbour is protected by a rocky peninsula about 3 m. long, but is open to the S.W. winds. Tobruk is 60 m. W. of Bardia.

DEFENCE OF TOBRUK. This harbour was of the utmost strategic importance in the Libyan campaigns of the Second Great War, for it lay athwart the lines of communications of any army advancing upon or retreating from Egypt along the coast. Shortly after Gen. Wavell began his westward drive against Graziani's Italian forces in Dec., 1940, preparations were made to capture Tobruk and utilise it as a supply base. The town was defended by a perimeter of gun emplacements, minefields, and anti-tank ditches, although the last were not deep enough to be effective. The harbour was protected by coastal and A.A. guns.

After a preliminary bombardment by the R.N. and the R.A.F., a combined air, sea, and land assault was launched early on Jan. 21, 1941. The main elements of the land forces were the 7th armoured and the 6th Australian infantry divs., three regts. of artillery, and machine-gun battalions of the Cheshire regt. and Northumberland Fusiliers, together with some Free French infantry. By nightfall the W. and S.W. portion of the perimeter, about one-third of the whole, had been taken with little opposition, except at Palestina. The attack



Tobruk, Cyrenaica. Air view showing the harbour, 1942. The pall of smoke is caused by burning petrol dumps
British Official

was resumed next morning and the town entered without resistance. Some 30,000 prisoners were taken as well as artillery, armour, vehicles, and stores. The Italians had damaged the harbour and shore installations.

Arrangements were immediately made to clear the harbour and stock the town with military stores for Wavell's army, which hoped to reach Tripoli. In April, however, German reinforcements reached the hard-pressed Italians, and the Axis forces made a counter-attack which forced Wavell to yield most of his territorial gains. As they advanced down the coast towards Egypt they by-passed Tobruk, intending to capture it later. The town was held by a British and Imperial garrison which had little difficulty in repelling land attacks; and made sorties against the Axis lines of communications, inflicting severe losses on the enemy. In Aug.-Sept. came repeated bombing attacks on the town and harbour, but although the garrison lost heavily in men and material, British local command of the sea enabled reinforcements and stores to be put in and the wounded removed. In eight months of defence 29,000 troops and 34,000 tons of stores were landed at Tobruk and 33,000 men taken off to Egypt. These operations were always carried out under cover of night.

When in Nov. the reorganized British force in Africa attacked, troops from Tobruk sallied out to join it at Sidi Rezegh. The 8th army drove on as far as El Agheila; then came the disaster at Knightsbridge, and Rommel broke through to force a British withdrawal on Tobruk. On June 14, 1942, the 8th army resumed its retreat to Egypt, but it was decided to hold Tobruk. As that had not been part of the original British plan, the perimeter had been left extremely vulnerable. The S. African 2nd div. and British 23rd armoured bde. were left as garrison under Gen. Klopper.

On June 20, after a preliminary air and artillery bombardment, the German 90th light div. attacked, overran the perimeter defences, and entered the town next morning. Two companies of Coldstream Guards and two of S. African infantry managed to fight their way out to rejoin the 8th army, but 28,000 men were taken. The fall of Tobruk was a severe shock to Allied public opinion; drastic changes in the N. African command resulted.

Throughout its German occupation, Tobruk was repeatedly raided by the R.A.F. On Sept. 13 there was a landing by a Royal Marine commando, but faulty timing marred success and cost two destroyers. When the 8th army advanced from Alamein, Tobruk was recaptured by Gen. Pienaar's S. Africans on Nov. 13, the German forces withdrawing without offering serious opposition. See N. Africa Campaigns.

Toby Jug. Small jug or mug. It is shaped somewhat like a stout man wearing a cocked hat, the three corners of which form spouts. These jugs were used for holding beer, but are now mostly found in collections. Introduced into England early in the 18th century they became very common and were also known as filpots.

Tocantins. River of N. Brazil. Rising in the S. part of the state of Goyaz, it flows N. through Pará and discharges into the Atlantic through the long, wide estuary called the Rio Pará. It is about 1,700 m. long; two portions of some 400 m. each are navigable, continuous navigation being barred by cataracts and rapids. It is tidal to Alcobaca, nearly 300 m. from the Atlantic. In its upper reaches it is called the Maranhão. Near its entry into Pará it is joined by the Araguayá (*q.v.*), its principal affluent. There is communication with the Amazon on the W., the land cut off forming the island of Marajo, or Joannes.

Toccata (Ital., touched). Piece for organ or pianoforte in the style of a prelude. It is characterized by numerous short notes; hence its name, signifying that the keyboard is lightly touched. Bach's organ and Schumann's pianoforte works of the kind are the most notable.

Toc H. Association of men and women pledged to Christian fellowship and service. During 1915-18 Talbot House provided rest and recreation in Poperinghe for British troops of all ranks serving in the trenches of the Ypres salient in the First Great War. It was named in memory of Gilbert Talbot, son of

Bishop Edward Talbot, and run by the Rev. P. T. B. ("Tubby") Clayton, who in 1919 founded the movement, its name being the army signaller's version of the initials of Talbot House. Members are pledged to befriend others, give personal service, and think and act without prejudice, challenging their generation to seek the will of Christ in the solution of all problems. There are 20 residential houses and 1,500 branches in all English speaking parts of the world. Toc H women's section works on similar lines. H.q. are at 47, Francis Street, London, S.W.1.

Tocharian. Ancient people in Central Asia. Originally Tarim basin town-dwellers, whose culture and speech were absorbed by the Altaian nomad Yueh-chi, their combined migration to the upper Oxus region of Tocharistan, and afterwards to Bactria, resulted in the Indo-Scyth Kushan kingdom. Lecoq and Stein brought from the Turfan documents in a dialect comprising an Aryan vocabulary of W. type, allied to Hittite, with Turkic constructions. Provisionally called Tocharian, it is now designated Kuchean.

Tocopilla. Coast town of Chile, in the prov. of Antofagasta. It stands on Algodon Bay, about 125 m. N. of Antofagasta city, and is connected by rly. with Santa Fé and by highways with Antofagasta and Iquique. Sulphur and borax are found in the vicinity, and there are smelting furnaces. Tocopilla exports nitrates, sulphates, iodine and copper ore. Pop. 17,287.

Tocqueville, ALEXIS CHARLES HENRI MAURICE CLÉREL DE (1805-59). French politician and writer. Born at Verneuil, Seine-et-Oise, July 29, 1805, he was called to the bar in 1826, and became a judge 1830. Having visited the U.S.A. he published his famous study of *La Démocratie en Amérique*, 1835. Deputy for Valogne, 1839-48, he was a member of the moderate opposition, a man of open and liberal mind, with a wide knowledge of democratic institutions. Elected to the constituent assembly, 1848, he soon became minister of foreign affairs. A protest against Louis Napoleon's *coup d'état*, 1851, led to a short imprisonment. Tocqueville lived abroad for several years, dying at Cannes, April 14, 1859. *Consult* Complete Works, 1860-65; *Recollections*, Eng. trans. A. Teixeira de Mattos, ed. J. P. Mayer, 1948.

Toda (Tamil, herdsmen). Pastoral tribe in the Nilgiri hills, S. India. Numbering a few hundred,



Toby Jug modelled by Walton, early 19th century
British Museum

they are tall, brown, and long-headed, and resemble the Ainu in hairiness. They speak a Dravidian dialect, and are polyandrous.

Todd, MARGARET (1859-1918). British doctor and author. She was educated at Glasgow and Berlin, and at the Edinburgh school of medicine for women, where she took her medical degrees in 1894. Under the name of Graham Travers she published *Mona Maclean*, a novel dealing with the life of a woman doctor, 1892; *Fellow Travellers*, 1896; and *Windyhaugh*, 1898. The chief literary work of her later years was her *Life of Dr. Sophia Jex-Blake*, 1918. She died Sept. 3, 1918.

Toddy. Primarily an intoxicating drink obtained by drawing off the sap of the coconut palm, or other similar trees. It ferments rapidly, and from it by distillation arrack is obtained. In Scotland toddy is the name given to a mixture of whisky, sugar, and hot water. The word is derived from a Hindustani one for a palm tree.

Toddy Palm (*Caryota urens*). Tree of the family Palmae. It is found native in India and Ceylon.



Toddy Palm. Crown of leaves and clustered, drooping flower spikes. Inset, single spike

It grows to a height of 50 or 60 ft., with a crown of curving, much-divided leaves which are 12 to 20 ft. long. The wedge-shaped leaflets have their broad, upper ends irregularly notched, and the base of the leaf stalk embraces the stem. The flowers are in drooping spikes, 10 or 12 ft. long, and the fruits are small, purple-skinned berries. The juice of the flower spike is known as palm wine or toddy, and when boiled it yields jaggery, or palm sugar, and sugar candy. The central parts of the stem yield a kind of sago; and the fibres of the leaf-stalk constitute kittul fibre, which is used for brooms, brushes, and ropes.

Todhunter, ISAAC (1820-84). British mathematician. Born Nov.

23, 1820, he was educated at University College, London, and St. John's College, Cambridge, of



Isaac Todhunter, British mathematician

which he became a fellow. He is chiefly known for his many mathematical text-books, the most successful of which was his *Euclid*, first published in 1862. His *Algebra*, 1858, *Trigonometry*, 1859, *Mechanics*, 1867, and *Mensuration* 1869, were for long standard text-books. He died March 1, 1884.

Tödi. Group of mountain peaks of Central Switzerland. They are situated on the borders of the cantons of Glarus, Uri, and Grisons, the loftiest summit being Tödi or Piz Rusein, with an alt. of 11,886 ft.

Todi (anc. Tuder). City of Italy, in the prov. of Perugia. It stands on a hill, alt. 1,494 ft., overlooking the Tiber, 23 m. S. of Perugia. Surrounded by vineyards and olive groves, it still retains its Etruscan and Roman walls. Notable buildings are a fine Romanesque cathedral, two medieval palaces, the Palazzo del Governo and Palazzo Comunale, and remains of Roman temples. The town, except for windows of the Renaissance church of Santa Maria della Consolazione, was uninjured in the Second Great War when it was captured by the 8th army June 15, 1944.

Todleben or **TOLLEBEN, FRANZ EDUARD IVANOVITCH, COUNT** (1818-84). Russian military engineer. Born at Mittau of German descent, May 20, 1818, he entered the Russian army in 1836. He served as an engineer in the Caucasus, 1848-51, but his fame rests upon his organization of the defences of Sevastopol in the Crimean War. Wounded during the siege, after it was over he was made chief of the engineers. He wrote an account of the defence of Sevastopol in five volumes, 1864-72. In the Russo-Turkish War of 1877-78 the reduction of Plevna was chiefly due to Todleben's engineering skill. He died July 1, 1884.

Todmorden. Mun. bor. and market town in the W. Riding of Yorks, England. It is situated on the river Calder, 19 m. by rly. N.E. of Manchester and is served by rly. and canal. The buildings include the modern Christ Church

and a town hall erected in 1875. The chief industries are cotton spinning and weaving, and there are also machine works and foundries. There is coal in the neighbourhood. Todmorden was incorporated in 1896. Pop. est. 18,600. *Pron.* with stress on the first syllable.

Todos os Santos Bay (Port., All Saints' Bay). Large opening of the Atlantic Ocean on the Brazilian coast of the state of Bahia. Sheltered by the island of Itaparica and a promontory, on which is situated Bahia, or San Salvador city, it is some 95 m. in circuit, and can harbour the largest fleets.

Todt, FRITZ (1891-1942). German engineer. He was born at Baden, Sept. 4, 1891, and, after serving in the First Great War, joined the Nazi party in 1923. When Hitler assumed power in 1933, he made Todt inspector-general of roads. Todt's first great



Fritz Todt, German engineer

task was to build the *Autobahnen*, Germany's new motor highways, and the Siegfried Line (*q.v.*). Made minister of munitions in 1940, he headed the Todt organization, which conscripted hundreds of thousands of workers in Germany and the occupied countries for work on fortifications, strategic roads and rlys., U-boat pens, air-raid shelters, etc. His death in an air accident was announced Feb. 8, 1942.

Tody. Bird belonging to the sub-family Todinae. Allied to the kingfisher, it is peculiar to the Greater Antilles. The W. Indian species *Todus viridis* is a native of Jamaica, but has allied species in Cuba, Haiti, and Puerto Rico, the largest specimen not exceeding 4½ ins. in length. Conspicuous for its bright, grass-green plumage, varying little with the sex, and red throat, the tody feeds on insects, and constructs burrows in which to lay its white and translucent shelled eggs.

Toga (Lat. *tegere*, to cover). National outer garment of men in ancient Rome. A woollen cloak, of elliptical or in later times crescent shape, with pointed ends,



Todmorden arms

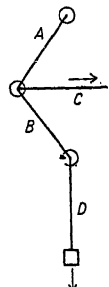
about four or five yards long, it was worn over the tunic, and wrapped round the body in various ways, but generally with one end hanging in front to the ankles, and the other drawn round the back under the right arm, and thrown over the left shoulder, where the weight kept it in place. The use of the toga was forbidden to slaves and foreigners, and when under the late republic it was replaced for ordinary wear by other garments, it remained a ceremonial and official robe until the 5th century A.D. The *toga candida*, whitened with chalk, was worn by candidates for office, and the embroidered *toga picta* by generals at their triumphs, while the *toga praetexta*, with a purple hem, was the dress of free-born boys and of curule magistrates. Emperors wore purple togas. See Rome.



Toga. Statue of M. Maximus, a Roman senator, wearing the toga Naples Museum

Toggenburg. Valley of the Upper Thur in N.E. Switzerland, in the canton of St. Gall. Over 30 m. long, it is fertile and of sub-alpine character. The chief occupations are agriculture, fruit-growing, and dairy farming. The persecution of the Protestants by the abbots of St. Gall led to the Toggenburg war in the early years of the 18th century. The dist. was ruled from the Middle Ages by the counts of Toggenburg, but in 1469 was purchased by the abbots of St. Gall. See Goat.

Toggle-Joint. Form of knee-joint used in machines for applying pressure or producing oscillating motion. In a simple form, as applied to a punching machine, the hinged pair of arms, A, B, is arranged vertically; B is connected to the punch rod, and A is pivoted to the hinge-point of A and B so that, when moved horizontally, this third arm will tend to straighten the knee-joint and cause the



Toggle-Joint. Diagram illustrating its construction. See text

punch rod (D) to move downwards. By actuating the pull-rod (C) by an eccentric, a continuous up-and-down motion can be transmitted to the punch-rod or ram; this type of action is used in stone-breakers. A toggle-joint was used in early hand-printing presses, replacing the slower action of a screw in bringing down the platen upon the type-forme. Toggles are used in modern presses for forging, punching, or drawing, and a toggle lever forms part of many other classes of machine.

Togliatti, PALMIRO. Contemporary Italian politician. A journalist and a communist, he left fascist Italy for Moscow in 1929, and under the pseudonym Ercole Ercoli was Italian member of the executive of the Comintern until its dissolution in 1943. He arrived back in Italy, March 28, 1944, and immediately assumed leadership of the Communist party there, persuading it and the other parties in the national council of liberation, then at loggerheads with Badoglio over the future of the monarchy, to leave this question on one side and enter in April an all-party interim govt. under Badoglio's premiership. Vice-premier in this and the Bonomi cabinets, he became minister of justice under Parri, June, 1945, and Gasperi until the elections June, 1946, when the Communists secured 104 out of 556 seats. Himself a successful candidate, he thereafter devoted himself to organization of the Communist party. An unsuccessful attempt was made on his life July 14, 1948.

Togo, HEIHACHIRO, COUNT (1847-1934). Japanese sailor. He was born in Dec., 1847, and trained in the Japanese navy from 1863, seeing action in the Civil War of 1868. In 1873 he entered the British training ship Worcester and spent some time in the R.N. college at Greenwich. Distinguishing himself in the Chinese war of 1894, he became rear-admiral. Promoted vice-admiral in 1900, he was commander-in-chief at the outbreak of the Russo-Japanese War, and performed signal service by destroying the Russian fleet in Port Arthur, Feb. 8-9, 1904, and by defeating Rozhdestvensky's fleet

at the battle of Tsushima, May 27, 1905. He was given the British Order of Merit in 1906. In 1912 he became admiral of the fleet. He died May 29, 1934. *Consult* Lives, R. V. C. Bodley, 1935; C. Ogasawara, Eng. trans. J. and T. Inouye, 1935.

Togoland (Fr. Togo). Dist. of W. Africa. It is administered by the U.K. and France under United Nations trusteeship. Bounded W. by the Gold Coast Colony, N. by French Upper Senegal and Niger Territory, E. by Dahomé, and S. by the Gulf of Guinea, it consists of a strip of territory extending about 320 m. from N. to S. and 140 m. from W. to E. in the broadest part, with a coast-line of about 33 m. The total area is 34,934 sq. m.; the British (W.) zone, 13,041 sq. m. in extent, does not touch the coast. The coastal region is flat and marshy, with many lagoons. Behind the coast the land rises gradually to a plateau of c. 1,200 ft. high, with hills up to 3,600 ft.

The principal rivers are the Volta, which forms the boundary between Togoland and the Gold Coast Colony, with its tribes, the Oti and Kulukpene, and the Monu, Haho, Sohio, and the Todschie rising in the central range. With the exception of that of the Volta, most of the river beds are dry during the dry season. In the S. of Togoland the rainfall is deficient. There are forests yielding some good timbers, notably teak and mahogany, but much of the land is infertile scrub. The chief products are palm-oil, cocoa, maize, rubber, copra, cotton, and coffee. Tobacco is grown to some extent in British Togoland.

The est. pop. is 1,310,000, including less than 1,000 Europeans. Pop. of British zone is est. at 390,000. The peoples in the S., among whom the Ewe and Ashanti are most numerous, use 30 different languages; those in the N., of Hamitic origin, make use of 16.

British Togoland is divided into two sections, the northern being attached administratively to the Northern Territories of the Gold Coast, the southern to the Gold Coast Colony. French Togoland is under a commissioner, and has one representative in the national assembly, two in the council of the republic, and sends one delegate to the assembly of the French Union.

Rlys. connect Lome, the chief port and capital, with Atakpame and Blitta to the N., 103 m.,



Count Togo, Japanese sailor

Palime for Misahöhe to the N.W., 72 m., and along the coast with Anecho, formerly Little Popo, 27 m. All three rlys. are in French Togoland. Numerous roads, some 2,700 m. in total length, and unsurpassed in W. Africa, act as feeders to the rlys. In addition to Lome (pop. 27,908, including 475 Europeans), the chief centres are Misahöhe, Kpandou, Atakpame, Kete-Kratchi, Sokode, Mangu, and Togo, all important trading stations. Ports are Lome, Porto Seguro, and Anecho.

HISTORY. In July, 1884, Dr. Nachtigal, acting on behalf of the German govt., signed a treaty with M'lapa, king of Togo, and hoisted the German flag at Bagida on July 5. From that date the country was administered by the Germans as a protectorate, the natives being treated with considerable severity.

In Aug., 1914, following the outbreak of the First Great War, the Germans surrendered unconditionally to French and British forces. Great Britain and France divided the country between them, Sept., 1920, receiving the approval of the League of Nations and a League mandate July, 1922. During the Second Great War, French Togoland remained under Vichy administration until in Nov., 1942, the governor-gen. of French W. Africa declared for Darlan (q.v.). The closing of the boundary between British and French Togoland during 1940-42 produced a number of administrative difficulties, since the Ewe tribe lives on both sides of the boundary. After the war Togoland continued to be administered by France and Great Britain, under United Nations trusteeship from 1946. An Anglo-French standing consultative commission for Togoland formed in 1948 decided to allow both local produce and the inhabitants to move freely across the boundary; coordination of educational and medical services was also agreed on, as well as economic exchanges. *Consult* Official reports of the British sphere of Togoland, annually; *Togoland Handbook*, H.M.S.O., 1920; *Le Togo*, Gen. Maroix, 1938.

Tojo, HIDEKI (1884-1948). Japanese soldier and statesman. Son of Eikyo Tojo, a well-known strategist of the Russo-Japanese War, 1904-05, he was born in Tokyo, and educated at the military staff college there. After the First Great War he studied strategy in Germany as military attaché. At home he was promoted

inspector-gen. of army air training, 1938, and did much to organize Manchuria. War minister in the



Hideki Tojo,
Japanese soldier

given dictatorial powers. In 1944 he assumed additional duties as chief of the general staff, but on the fall of his cabinet on July 18 he relinquished that post also. Arrested as a war criminal by U.S. forces, Sept. 11, 1945, he was brought to trial in Tokyo after an attempt to shoot himself. Condemned to death, Nov. 12, 1948, he was hanged Dec. 23.

Tokat. Town of Asiatic Turkey. Situated on the Toranti Su, about 50 m. N.W. of Sivas, it is the capital of Tokat vilayet. It was once a great centre of trade, and still has industries of importance, manufacturing leather and copper ware. In its neighbourhood are deposits of iron and coal. Tokat was the scene of an Armenian massacre in 1895, and suffered similarly during the First Great War. It has Roman tombs and ruins of an old Byzantine castle, crowning a hill which dominates the town. Pop., town, 22,390; vilayet, 342,244.

Tokay. Town of Hungary, in the co. of Zemplén. It stands at the confluence of the Bodrog and Theiss (Tisza), 43 m. N.N.W. of Debreczen, and is the market for the celebrated Tokay wine, produced on the vine-clad slopes of the Hegyalja, a hill ridge which lies to the N.W. The town has rly. connexion with Miskolcz and Nyiregyhaza.

Tokay. Hungarian wine produced in the neighbourhood of Tokay. A sweet, delicious white wine, it owes its peculiar qualities both to the hot climate and to the mode of preparation. "Essence" or imperial Tokay is made from the juice of over-ripe grapes, expressed by their own weight, and is a liqueur wine of the highest quality, having a fine flavour, rich bouquet, and elegant greenish colour; it contains some 8 p.c. of alcohol. Ausbruch, made from a mixture of dried ordinary grapes, ranks next, and has about 14 p.c. of alcohol.

Token. Numismatic term for any redeemable coin circulated at

a higher value than that of the metal it contains. All silver and bronze coins now minted in Great Britain are tokens protected from depreciation by limitations as to legal tender. Lack of legal small change in England caused the use of illegal leaden tokens early in the 15th century. Elizabeth licensed the city of Bristol to issue copper tokens. Lead tokens were again in use during the reign of James I, but the mass issues by tradesmen and others took place in the three periods 1648-72, 1787-99, and 1811-15, including latterly silver and gold tokens.

The Token Acts of 1817-18 finally stopped the private minting of currency. Attempts to evade the Acts were made in Ireland, and as late as 1830-31 some Manx tokens were coined. In British possessions overseas, spasmodic issues by traders occurred between the dates of the Carolina halfpenny of 1694 and the Christchurch, N.Z., penny of 1881. Collectors of tradesmen's copper tokens should remember that the later issues were mingled with huge quantities of imitation tokens. *See* Coinage; Numismatics.

Tokyo. Capital of Japan, and of a dept. of the same name. Situated on the S.E. coast of Honshu, in the prov. of Musashi, the city lies on Tokyo Bay and on both banks of the river Sumida. It is the terminus of several rlys. Formerly called Yedo or Jeddo, it was renamed Toyko (Eastern city) in 1868. With a pop. of 6,778,804 in 1940, it was the third largest metropolis in the world.

Tokyo proper lies to the W. of the river. It is almost surrounded by water, and is intersected by canals. Bridges connect it with the E. part of the city across the river. The city proper contained many temples, notably the temple of Hachiman, the war god, and the Gohyaku-Rakan-ji temple of 500 images. Here also were the palaces of the daimios, demolished after this class of territorial nobles was suppressed following the revolution of 1868. Many trees adorned Tokyo's streets. Parks included those of Ueno to the N.E., containing zoological gardens and a museum, and Shiba to the S.W.

Tokyo proper is divided into wards. The castle or palace of the emperor, a handsome structure in Japanese style dating from 1888 and seriously damaged in an air raid of May 26, 1945, is built round the site of the former shogun's palace. It occupies the centre of Kojimachi ward, which was the most densely peopled



Tokyo, Japan. 1. Looking west from the Ginza; on the right is the Asahi newspaper building; the circular building beyond is the Nippon theatre. 2. The Ginza, a popular shopping centre, showing bomb damage. 3. The effect on a section of the city of incendiary bombs in the Second Great War

portion of the city, and contained the mercantile quarter, many European buildings, the gov't. buildings, educational establishments, factories, mills, and workshops. The suburbs N., W., and S. of the castle were noteworthy for the number of their temples. Here were the Russian cathedral; the temple of Kwannon, goddess of mercy, one of the most venerable and picturesque in the country;

the military academy; and the military arsenal. In the W. and S.W. lay foreign embassies and legations and the barracks. Electric tramways and an underground rly. provide transport.

The manufacturing interests of Toyko were considerable, and much enlarged during the 1930s and early 1940s by development of war industries; commerce was of small consequence. Printing

and publishing were important many newspapers and journals, some in English, being published. Extensive libraries included the university library and the imperial cabinet library. Tokyo imperial university, founded 1877, took rank before the Second Great War with the principal universities of the world.

Tokyo was founded in the 16th century. It several times suffered

from fire, notably in 1892 when 4,000 houses were burnt down in a morning. The population in 1872 was less than 780,000; by 1920 it was more than 2,000,000. The greater part of the city was destroyed by an earthquake on Sept. 1, 1923, which killed about 30,000. In the rebuilding, which was carried out with remarkable speed, the centre was redesigned to include wide "firebreaker" streets; much of the new building was of steel and concrete construction, such buildings put up earlier having withstood the earthquake shock well, and the city lost its Japanese appearance.

During the Second Great War Tokyo became in the last months the most frequent target of U.S. air attacks in the Pacific. First raided April 18, 1942, by carrier-borne aircraft led by Lt.-Col. Doolittle (*q.v.*), it was not raided again until Nov. 24, 1944, by Superfortresses from bases in captured Saipan, Marianne Is., 1,500 m. away. Raids by land-based and carrier-borne aircraft became thereafter frequent and intense, culminating in two raids on May 23 and 26 in which 4,500 tons and 4,000 tons of incendiaries of a new type were dropped—6 lb. bombs filled with jellied petrol and dropped in 500 lb. clusters. When the Allies reached Tokyo they found 80 p.c. of the city laid waste.

After the surrender of Japan, General MacArthur entered Tokyo at the head of his troops Sept. 8, 1945, and set up here the h.q. of the Allied occupation forces of Japan. The Far Eastern International Tribunal for the trial of Japanese leaders accused of war crimes was set up in Tokyo, May 3, 1946. See Tokyo Trials.

Tokyo Bay OR **YEDO BAY**. Inlet on the S.E. coast of Honshu I., Japan. It extends N. for about 50 m. and on its N.W. shore stands Tokyo. At 10.30 a.m. Tokyo time (2.30 a.m. B.S.T.) on Sept. 2, 1945, hostilities in the Second Great War formally ended when the unconditional surrender of Japan was signed on board the battleship U.S.S. Missouri in Tokyo Bay, which was filled by an armada of Allied naval shipping.

Tokyo Trials. Trial for war crimes of leading Japanese military and political leaders held in Tokyo after the Second Great War. The members of the Far Eastern International Tribunal before which the trial was held were selected by Gen. MacArthur from names submitted by the Allied

signatories to the Japanese surrender and were: Sir William F. Webb, chief justice of Queensland, (Australia), president; Justice E. Stuart McDougall (Canada); Judge Mei Ju-ao (China); Henri Reimburger (France); Bernard Victor A. Roling (Netherlands); Justice Harvey Northcroft (N.Z.); Judge I. M. Zaryanov (U.S.S.R.); Lord Patrick, dean of the faculty of advocates, Scotland (U.K.); Justice John P. Higgins (U.S.A.), whose place was taken in July, 1946, by Maj.-Gen. Myron G. Kramer. The international, and chief U.S., prosecutor was Joseph B. Keenan; chief British prosecutor A. S. Comyns Carr, assisted by Christmas Humphreys; chief Australian prosecutor Justice Mansfield.

The tribunal began its sittings May 3, 1946. Before it were brought 28 men designated as war criminals by the United Nations War Crimes Commission:

Gen. Sadao Araki, war minister and member, supreme war council;
Gen. Kenji Doihara, head of intelligence in Manchuria;

Col. Kingoro Hashimoto, who took part in the sack of Nanking, 1937, and was responsible for attacks on the U.S. gunboat Panay (see Panay Incident) and H.M. gunboats Ladybird and Bee;

F.-M. Shunroku Hata, member, supreme war council and one-time c.-in-c. China;

Baron Kichura Hiranuma, premier 1939;

Koki Hirota, premier 1936;

Naoki Hoshino, former president of the planning board;

Gen. Seishiro Itagaki, chief of staff, Kwangtung army;

Okonori Kaya, minister of finance under Tojo;

Marquis Koichi Kido, lord keeper of the privy seal;

Gen. Heitaro Kimura, vice-minister of war under Tojo;

Gen. Kuniaki Koiso, premier;

Gen. Iwane Matsui, member, cabinet advisory council, 1938-39, and commandant during the Nanking massacre, 1937;

Yosuke Matsuoaka, foreign minister;

Gen. Jiro Minami, war minister and c.-in-c. Kwangtung army;

Gen. Akira Muto, chief of military affairs bureau, 1939-42, and chief of staff to Yamashita (*q.v.*) in the Philippines;

Adm. Osami Nagano, member, supreme war council;

Takasumi Oka, chief of navy bureau of military affairs, 1940-44;

Shumei Okawa, leading propagandist for "Greater East Asia";

Gen. Hiroshi Oshima, ambassador to Germany, 1938-45;

Lt.-Gen. Kenryo Sato, chief of military affairs bureau, 1942-44;

Mamoru Shigemitsu, foreign minister;

Vice-Adm. Shigetaro Shimada, navy minister under Tojo;

Toshio Shiratori, ambassador to Italy;

Lt.-Gen. Teiichi Suzuki, minister without portfolio under Tojo;

Shigenori Togo, foreign minister under Tojo;

Gen. Hideki Tojo, prime minister at the time of Pearl Harbour;

Gen. Yoshijiro Umezu, vice-minister of war.

The 55 counts of the indictment were divided into crimes against peace, "conventional war crimes," and crimes against humanity. Among them were charges of preparing to wage aggressive war since 1928; military aggression in Manchuria and China; use of poison gas in China; collaboration with Germany and Italy; unprovoked aggression against the U.S.A., Great Britain, the Philippines, Netherlands East Indies, French Indo-China, and Siam; acts of aggression against the Soviet Union; wholesale murder and maltreatment of Allied prisoners of war, and of civilians in areas under Japanese military occupation. All the accused, who were represented by Japanese and U.S. counsel, pleaded not guilty. Keenan opened for the prosecution on June 4, 1946. On April 9, 1947, Okawa was pronounced mentally incapable of standing trial. Matsuoaka died June 27, 1946, Nagano Jan. 5, 1947. All the remaining defendants were found guilty in the judgement read Nov. 12, 1948. Doihara, Hirota, Itagaki, Kimura, Matsui, Muto, and Tojo were sentenced to death, and hanged Dec. 23; Shigemitsu received seven years' imprisonment, Togo 20 years, the rest life sentences. All except Matsui and Shigemitsu were found guilty of conspiracy to wage aggressive war. Matsui was guilty on one count only—doing nothing effective to abate horrors committed by soldiers under his command at Nanking, 1937. Shigemitsu was guilty of waging aggressive war and of failing to investigate treatment of prisoners of war; he was paroled in 1950. Shiratori died June 5, 1949; Togo died July 23, 1950.

Tolbooth. Term originally applied to the booth at a fair in which dues were collected and offenders against fair regulations were detained. From the latter use it came to mean a town prison. The most famous tolbooth was the former prison of Edinburgh, described by Scott in *The Heart of Midlothian*. It stood beside St. Giles's cathedral in the High Street, its oldest parts dating from



Toledo, Spain. 1. Gothic cathedral, from the south-east, showing the graceful 16th-century tower. 2. Alcántara bridge over the Tagus looking towards Alcázar. 3. General view of the city, showing damage sustained during the civil war of 1936-39

the 15th century, and was finally swept away in 1817, its site being marked by a heart let into the causeway. There were tolbooths in other Scottish towns, *e.g.* Selkirk. See Canongate.

Tolbukhin. FYODOR IVANOVICH (1884-1949). Russian soldier, who enlisted in the tsarist army and served in the First Great War. Transferring to the Red army, 1917, he held staff appointments and district commands. In the Second Great War he served in the offensive which destroyed Paulus's 6th German army at Stalingrad. On the S. front in 1943 he regained Taganrog and Melitopol. As commander of the 4th Ukrainian army he joined in the drive through the Crimea that resulted in the recapture of Sevastopol in 1944; and with the 3rd Ukrainian army he isolated Budapest, and advanced through Rumania into Bulgaria, representing Russia at the signing in Moscow of the Allied armistice with Bulgaria, Oct. 28, 1944. Next year he led the offensive into Austria, capturing Vienna on April 13. He was promoted marshal of the Soviet Union, Sept., 1944. His death was announced Oct. 17, 1949.

Toledo. Prov. of central Spain. It is bounded N. by the provs. of Avila and Madrid, W. by Cáceres, E. by Cuenca, S. by Badajoz and Ciudad Real, lying mainly in the basin of the Tagus. An elevated

tableland where not mountainous, in the S. it is largely covered by the Montes de Toledo, and drained by the Tagus, besides the Guadarrama and other tributaries. Chief industries are agriculture and stock raising, including draught oxen and fighting bulls, mules, asses, and goats; manufactures of textiles, earthenware, oil, wine and spirits, soap, and guitar-strings. Minerals abound, *e.g.* lead, iron, copper, gold, silver, but are little worked. The capital is Toledo. The area of the prov. is 5,925 sq. m. Pop. 474,001.

Toledo. City of Spain, capital of the prov. of Toledo and formerly of Spain. It stands on the river



Toledo arms

Tagus, 47 m. by rly. S.S.W. of Madrid. To the S.W. are mts., culminating in Rocigalgo, 4,750 ft. Situated on a rocky bluff, encompassed on three sides by the deep gorge of the Tagus, defended by lofty Moorish-Gothic walls, and dominated by the cathedral and the Alcázar, Toledo is one of the most imposing and romantic cities of Spain. It has narrow, tortuous streets flanked by tall houses of dull exterior with huge doorways, and has been likened in turn to an immense convent, prison, fortress, or seraglio. Pop. 27,443.

The cathedral (1227-1493) is a magnificent five-aisled Spanish-Gothic edifice, and has many richly embellished chapels. The castle-palace, though burnt and rebuilt several times, is huge and impressive. Two fine bridges span the deep gorge—the medieval five-arched bridge of San Martin and the Moorish bridge of Alcántara.

The bulwark and centre of Christianity in Spain, Toledo is full of churches of great age, interest, and beauty. Numbers of the old gateways and towers are extant, as are many relics of Moorish art and architecture. The university was suppressed in 1807. There are many convents, an archiepiscopal palace with a well-stocked library, and a 15th century town hall. The manufactures are cloth, ecclesiastical vestments, and outlery; Toledo sword-blades have been famous from Roman times.

The origin of Toledo is lost in remote antiquity; it was once a stronghold of the Carpetani, a Roman "colonia," a Visigothic capital, a Moorish city, and in 1087 capital of Leon and Castile, its decline dating from 1560, when Philip II selected Madrid as sole capital. Toledo was occupied by the French in 1808. At the outbreak of the Spanish civil war in 1936 Nationalist supporters seized Toledo, and held it for two months until relieved by Franco's troops advancing from the S., Sept. 27.

Toledo. City of Ohio, U.S.A., the co. seat of Lucas co. It stands at the head of Maumee Bay, at the W. end of Lake Erie, and is served by the Pennsylvania and other rlys. and by several steamship lines. Toledo harbour has a shore line of 35 m. and depth of 24 ft. The city supports a symphony orchestra, and in its art museum is a fine collection of Egyptian antiquities. Industrially it ranks second in the state to Cincinnati, making motor vehicles, wagons, bicycles, electrical appliances, glass and bottles, and having factories processing sugar, flour, and coffee. A distributing centre, it receives vast consignments of iron ore, and trades in grain, timber, and soft coal. In 1835 the governors of Michigan and Ohio ordered troops facing each other 10 m. apart to occupy the rich agricultural land which was the site of the future city; and next year Toledo was incorporated as a city of Ohio. Pop. 282,349.

Toledo, COUNCILS OF. Name given to a series of synods, some thirty in number, which met at Toledo, 400-1583. They dealt with many ecclesiastical questions, doctrinal and disciplinary. The most important was that of 1565-66, which regulated the execution of the Tridentine decrees. See Trent, Council of.

Tolentino (anc. *Tolentinum Picenum*). City of Italy, in the prov. of Macerata. It occupies a fine position on the river Chienti, 11 m. by rly. S.W. of Macerata. Its cathedral, San Catero, was founded in the 13th century, and there are many other churches of architectural interest, enriched with fine frescoes and reliefs. It has a museum, and in the vicinity is the Picene necropolis of the 8th to 4th centuries B.C. The manufactures include silks, woollens, and wine. Here in 1797 a treaty of peace was signed by the pope and Napoleon; and in the neighbourhood the Austrians defeated the Neapolitans under Murat, May 3, 1815. Pop. approx. 14,000.

Toleration. Term applied to state recognition of the right of private judgement, especially in regard to religious doctrine and forms of divine worship. The spirit it represents is often dated from the protest made by a Frenchman, Châtillon, who, writing under the name of Martin Bellius, protested against the act of Calvin in burning Servetus for his opinions on the Trinity. Its growth was due to the gradually increasing influence, in France, of the writings of Mon-

taigne, Descartes, and Bayle, and, in England, of the works of Milton, Roger Williams, Jeremy Taylor, Berkeley, Chillingworth, Robert Barclay, Locke, and J. S. Mill.

Dogmatic systems of religion are necessarily opposed to toleration, which is contested on the ground that heresy is a crime against the soul, and that toleration is but a step towards indifferentism, atheism, agnosticism, and rationalism. The problem is complicated by political and dynastic considerations. In Great Britain the right of private judgement is restricted only by provision for the defence of public decency, morality, and good order, and the liberty of others. See Catholic Emancipation; Disestablishment; Infallibility; Liberty; Nonconformity.

Toleration Act. Passed by the English parliament in 1689 just after the accession of William and Mary. While by no means granting general toleration to dissenters from the Church of England who suffered under the laws passed in the time of Charles II, it allowed those Protestant nonconformists who accepted the doctrine of the Trinity, and were willing to take the oaths of allegiance and supremacy, to hold religious services without molestation, provided this was done with open doors. It did little more, in fact, than repeal the Conventicle Act of 1664.

Tolima. Inland department of Central Colombia. It lies between the Eastern and Central Cordilleras of the Andes. Named from the volcano Tolima (v.i.), situated on the N.W. boundary, it holds the upper valley of the Magdalena, with several lakes. The climate is one of great extremes. Minerals include gold, silver, copper, lead, and sulphur. Stock-raising and agriculture are carried on, the principal crops being sugar, cocoa, rice, maize, and tobacco. The capital is Ibagué, and the area 8,874 sq. m. Pop. est. 691,360.

Tolima. Volcanic peak of the Andes, situated on the N.W. frontier of Tolima dept., Colombia. The loftiest mountain in the republic, attaining an alt. of 18,400 ft., it was active in 1829.

Toll. In general, duty paid in consideration of certain privileges or services. The term was applied especially to charges levied for the use of certain roads or bridges, the proceeds being devoted to their construction, improvement, or upkeep. An early English toll was that made for road repairs between Temple Bar and St. Giles's, about 1270. Tolls became general, and

in the 17th century gates or turnpikes were commonly set up to facilitate their collection. The toll-gates remained a familiar feature of main-road travel until well on into the 19th century, but practically all have been removed. Tolls on London bridges were abolished in 1878-79. See Roads.

Toller, ERNST (1893-1939). German writer and dramatist. Born of Jewish parentage, Dec. 1, 1893, he was educated in Germany, and after serving in the First Great War became a revolutionary. He took part in the abortive Munich revolt of 1919, led the independent social democratic party, and was president of the soldiers' and workers' council during the brief Bavarian soviet republic. Sentenced to five years in prison, he there wrote plays and poetry which later gave him European reputation. In Expressionist drama he is known for *Masse-Mensch* (Masses and Men), 1921; and *Maschinenstürmer* (The Machine Wreckers), 1922. Other works were *The Swallow Book*, and *Letters from Prison*. Under the Nazis Toller was deprived of his nationality, and became a refugee in England. He died, by suicide, in New York, May 22, 1939.

Tolley, CYRIL JAMES HASTINGS (b. 1895). English golfer. A Londoner, born Sept. 14, 1895, he went to University College, Oxford, was a prisoner of war from 1917, and in 1921 went on the stock exchange. He was British amateur golf



Cyril Tolley,
English golfer

champion in 1920 and 1929; Welsh, 1921 and 1923; French open champion, 1924 and 1928; played against Scotland every season 1922-30; and often in Walker Cup matches against America up to 1934. In 1925 at Troon he drove a ball 290 yds.

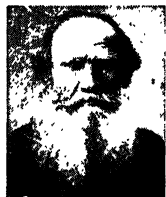
Tolpuddle Martyrs. Name given to six labourers of a village in Dorset who on March 18, 1834, were tried for an offence against the Combination Acts (*q.v.*) and sentenced to transportation to Botany Bay for seven years. The men had formed a "friendly society of agricultural labourers" through which they hoped to press for a weekly wage of 10s., but had neither presented any demand nor gone on strike. The severity of the punishment evoked so many pro-

tests and petitions that in 1836 the rest of the sentence was remitted. A play, *Six Men of Dorset*, by Miles Malleson and H. Brooks, was produced in 1938. *Consult Flame of Freedom*, O. Rattenbury, 1931.

Tolstoy, ALEXEI KONSTANTINOVICH, COUNT (1817-75). Russian poet and dramatist. A distant relative of Leo Tolstoy, he was born at St. Petersburg, Sept. 5, 1817, and began writing verses as a child. He was a happy singer of old-time Russian ballads, and wrote tender and dainty lyrics, which were set to music by Tchaikovsky. As a lyricist he was little touched with the melancholy of so many Russian writers. As a dramatist he was chiefly notable for his historical trilogy, *The Death of Ivan the Terrible*, 1866; *The Tsar Feodor Ivanovitch*, 1868; *The Tsar Boris*, 1870. Of his novels, *Prince Serebrenni* and *The Terrible Tsar* were translated into English. He died Oct. 10, 1875.

Tolstoy, ALEXEI NIKOLAEVICH (1882-1945). Russian writer. A relative of Leo Tolstoy, he was until the revolution Count Alexis Tolstoy. In 1910 he established his reputation as a short story writer, and during the First Great War visited England as a journalist. Back in Russia he published the trilogy translated into English as *The Road to Calvary*, awarded the Stalin prize, 1942. He was president of a special commission set up to inquire into German atrocities during the Second Great War. A play, *Ivan the Terrible*, was produced in 1944, and he was at work on the third part of an ambitious study of Peter the Great when he died Feb. 24, 1945.

Tolstoy, COUNT LEO NIKOLAEVICH (1828-1910). Russian novelist, social reformer, and religious teacher. He belonged to an ancient family ennobled under Peter the Great. He was born on the family estate, Yasnaya Polyana, in the prov. of Tula, Aug.



Leon Tolstoy

28 (O.S.), 1828. The boy lost his mother as an infant, and his father when he was nine; and with his brothers and sisters was brought up by relatives. In 1843 at the university of Kazan he shared the frivolous life of his class, but experienced moments of indignation against the idle rich.

In 1851 he went to the Caucasus, took a commission in the army, and began writing his first story, *The Cossacks*, published in 1863. His first published work was *Childhood*, largely autobiographical, which made a stir on account of the extraordinary literary promise it contained. It was followed by *Boyhood*, and *Youth*. The *Sevastopol Stories*, the first instalment of which appeared in 1854, were based on Tolstoy's personal impressions of the Crimean War, in which he had served. These stories revealed the gifts fully displayed in *War and Peace*.

After a few years of life in St. Petersburg, and two journeys abroad, Tolstoy settled down on his estate as a magistrate, conceiving a scheme for helping the peasantry. In 1861-62 he maintained a school for peasant children at Yasnaya Polyana, and published an educational review. His marriage in 1862 marks the end of the first period of his life and work, which was one of inner growth, leading him to a stern conception of duty towards the peasantry. Some of his best short stories belong to this period. Powerful realism in the rendering of life and character is deepened in Tolstoy's short tales by social problems, by longing to adjust the relations between rich and poor, and the search for the meaning of life.

Two great novels, *War and Peace* (*q.v.*), written in the years 1865-69, and *Anna Karenina* (*q.v.*), 1875-76, are the outcome of Tolstoy's second period, and represent his highest achievements in art.

Anna Karenina marks the transition to the third period of Tolstoy's life. The substance of the novel is a passionate protest against life deprived of a consciousness of inner duty.

Tolstoy's inner crisis was reached in 1881. Prepared by his previous work and thoughts, he became the great moralist and religious teacher that he was to the end. Passing from inner despair which brought him to the verge of suicide, he found peace in the teaching of Christ, and evolved the fundamental principle of his new faith that "the Kingdom of God is within you," that God is love, and that the meaning of life is the conformity to the principle of love. The chief works containing his moral and religious teachings are: *My Confession*; *On Life*; *What I Believe*; *The Kingdom of God is Within You*; *The Four Gospels*, harmonised and translated; *What*

Are We to Do? Works of fiction containing his teaching are *The Kreutzer Sonata*; *Resurrection*; *The Death of Ivan Ilyitch*, and a number of short stories for the peasants, many based on folklore.

Tolstoy did his utmost to conform in his own life to his teaching, to make it simple, and adjust it to the life of the peasant. In the last year of his life he carried out a long-cherished dream of abandoning his comfortable home, and disappearing among the peasants. He actually set out to go away on Oct. 28, 1910, but fell ill and died at a railway station on Nov. 7. His widow died on Nov. 4, 1919. Yasnaya Polyana, which had been turned into a Tolstoy Museum, was desecrated and almost destroyed in the Second Great War, when it was in the German occupied area.

Bibliography. Tolstoy: the Grand Mujik, G. H. Perris, 1898; Tolstoy, the Man and Artist, D. Morjkovsky, 1902; Tolstoy: the Man, E. A. Steiner, 1904; Reminiscences, I. L. Tolstoy, 1914; Tolstoy, His Life and Writings, E. Garnett, 1914; L. Tolstoy, A. Maude, 1918; *The Tragedy of Tolstoy*, Countess A. Tolstoy, 1933; Count Leo Tolstoy, E. J. Dillon, 1934; Tolstoy, G. Abraham, 1935; Tolstoy and his Wife, Tikhon Polner, Eng. trans. N. Wilden, 1946.

Toltec. Name denoting an ancient culture anterior to the Aztec domination on the Mexican tableland. Early Spanish accounts of a Toltec race, traditionally dating from the 6th century, are largely mythical, but the existence of an advanced pre-Aztec culture is attested by remains at Tollan, Cholula, Teotihuacan, and elsewhere. See *Aztec*; *Maya*; *Mexico*.

Tolu, BALSAM OF. Balsam which exudes from incisions in the trunk of *Myroxylon toluiferum*, grown in New Granada. It is used as an expectorant in chronic bronchitis.

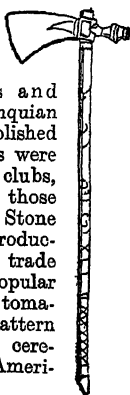
Toluca. Town of Mexico, capital of the state of Mexico. Situated 36 miles W.S.W. of Mexico City and served by the national rlys. of Mexico, its chief features are the state building, the national institute, and the cathedral. In the neighbourhood is Nevada de Toluca, an extinct volcano 15,150 ft. high. Pop. 97,462.

Toluene OR METHYL BENZENE ($C_6H_5.CH_3$). Liquid resembling benzene, obtained as one of the products of distilling coal tar. It was discovered by Pelletier and Walter, two French chemists, and so called from tolu balsam, from which it may be distilled. Toluene is used in the manufacture of explosives and aniline dyes. See *Trinitrotoluene*.

Toluidine ($C_6H_4.CH_3.NH_2$). Colourless oily fluid prepared by reducing nitrotoluene in the same way that aniline is made from nitrobenzene. There are three isomeric toluidines, the ortho-, meta-, and para-toluidine, the first of these being the most important. Orthotoluidine differs from the other toluidines in giving a green colour with ferric chloride and paradiamidobenzene. Paratoluidine is a solid. The toluidines are employed in the manufacture of aniline dyes. See Aniline.

Tomahawk

(Cree, hammer). Name applied to various N. American implements and weapons of the Algonquian tribes. Horn or polished stone celt hatchets were fitted into holed clubs, closely resembling those of the European Stone Age. After the introduction of the modern trade iron hatchet—the popular conception of a tomahawk—the native pattern was retained for ceremonial uses. See American Indians.



Tomato (*Lycopersicon esculentum*). Annual plant of the family Solanaceae. A native of S. America, it was first introduced into England in 1596, and was originally grown as a greenhouse climber for the sake of its red and yellow berries, as they were termed. As the Solanaceae include many poisonous species, the edible properties of the tomato were not at first appreciated in the form of fresh fruit. It became popular in the U.K. only within living memory.

Tomatoes for outdoor culture are raised from seed sown in pots in rich soil in early spring, and forced on in gentle heat. When about two months old, the plants may be removed to a cold frame for hardening off before planting out, which should take place in June. Out of doors they require a position against a warm S. wall, and a soil which has not recently been manured. They should be planted about 1 ft. or 18 ins. apart, staked, and (except in bush varieties) all side shoots should be removed. Salt or nitrate of soda is the best artificial stimulant to apply, and no strong manure should be used. When the fruit will not ripen on the plants, it should be removed and either exposed to the sun in a greenhouse or any sunny window, or wrapped in paper



Tomato. Ripe edible fruits of a cultivated English variety

and placed in a dark place. Tomatoes should not be grown in the same soil or bed for more than three years in succession.

The tomato is one of the most popular vegetables throughout the world, and huge quantities are grown, both commercially and in gardens. Almost 200 varieties exist. Eaten raw, cooked or canned, made into purées, soups, sauces, tomato juice, "cocktails," etc., it is a rich source of vitamin C and perhaps the commonest flavouring for canned fish and other processed foods. An important export of the Channel Is., S. France, etc., in England it thrives under glass especially at Worthing and in the Lea valley.

Tomb (Gr. *tymbos*; cf. Lat. *tumulus*, mound). Place of burial, usually implying an artificial construction intended to guard the dead from disturbance at the hands of ill-doers. The word is also used in a general sense, like grave, for the state after death. See Architecture; Burial Acts; Burial Customs; Petra; Sepulchre.

Tombac. Name given to a variety of brass. Also called Muntz or patent metal, it was invented by G. F. Muntz in 1832, and contains about 40 p.c. of zinc and 60 p.c. of copper. It has a full yellow colour.

Tombola. Lottery game. It is popular in France and the southern states of the U.S.A., as well as in the Royal Navy and at garden fêtes in England. Each entrant is provided with a card containing certain numbers, prizes being awarded to the holders of cards on which all numbers have been drawn.

Tombolo. Bar or sandbank connecting an island with the mainland. Tombolos are formed by the growth of spits from the island towards the mainland, with the sweeping of sand around the island by waves. The sandbank on the protected side of the island

gradually develops until it connects with the shore deposits of the coast itself.

Tom Brown's Schooldays. Story by Thomas Hughes, first published in 1857. Depicting life at Rugby school under Arnold, it is regarded as the classic English school story. Its avuncular style and racy descriptions of games make palatable its clear Christian preaching. In 1861 a sequel, Tom Brown at Oxford, proved less successful.

Tomelloso. Town of Spain, in the prov. of Ciudad Real. It is the centre of a rich agricultural district and carries a large trade in cereals and fruit. Terminus of a branch rly., it lies 72 m. S.E. of Toledo. Pop. 22,800.

Tomni. Town on the Black Sea, about 100 m. S. of the mouth of the Danube, 70 m. S.S.W. of the Danube delta. It is almost the same place as the modern Constanta, Rumania. Tomni was the place of exile of the poet Ovid when he had incurred the displeasure of Augustus. Here he wrote the latter portion of the Fasti, the Tristia, and the Letters from Pontus, expressing his discontent at having to live in such a remote and inhospitable place.

Tomini OR GORONTALO GULF. Inlet penetrating the N.E. coast of the island of Celebes, Indonesia, for 235 m. At its entrance it is 65 m. wide, gradually widening to nearly 100 m. It is traversed by the equator; and is navigable.

Tomintoul. Highest village (1,160 ft.) in the Scottish Highlands. It is in Banffshire, 10 m. S.E. of Grantown-on-Spey, in a district of numerous streams encircled by moors. Angling and shooting are available for visitors. There is an impressive R.C. church.

Tom Jones. Novel by Fielding, published in 1749, its full title being The History of Tom Jones, a Foundling. Generally accepted as its author's greatest work, and one of the finest stories in English, fascinating by its sense of reality, it has been summed up as an epic of the healthy average life of the healthy average man. Frequently coarse in phrasing and incident, the story is one of the fullest renderings in 18th century fiction of contemporary English life and manners.

Tomlinson, GEORGE (b. 1890). English politician. Born at Rish-ton, Lancs, March 21, 1890, he was educated at the Wesleyan day school there. A cotton-weaver from the age of 12, he entered politics as a trade unionist, becom-

ing a Lancashire county councillor in 1931. Elected Socialist M.P. for Farnworth in 1938, he was parl. secretary to the ministry of Labour 1941-45. During 1945-47 he was minister of Works, then became minister of Education.

Tomlinson, HENRY MAJOR (b. 1873). English writer. He first came into prominence as a member



H. M. Tomlinson,
English writer

of the staff of the *Morning Leader*, 1904, later working on the *Daily News* and acting during the First Great War as war correspondent in France and Belgium. He also became known for books with a nautical background. *The Sea and the Jungle*, 1912; *Old Junk*, 1918; *London River*, 1921, were all received well, but it was with *Gallion's Reach*, 1927, that he was acclaimed as first-rate in his own element. This book won the *Femina-Vie Heureuse* prize. *All Our Yesterdays*, 1930, a poignant study of the First Great War, achieved great success, and *The Snows of Helicon*, 1933, was a departure from sea and river. Later works included *The Turn of the Tide*, 1945; *Morning Light*, 1946.

Tommy Atkins. Popular term for a British private soldier, usually contracted to Tommy (plur. *Tommies*). It was derived from a specimen enlistment form in which the blanks were filled up *pro forma*, and the name Thomas Atkins appeared as that of the imaginary recruit. The equivalent French nickname in 1915 was *poilu*; the American in the Second Great War was G.I.

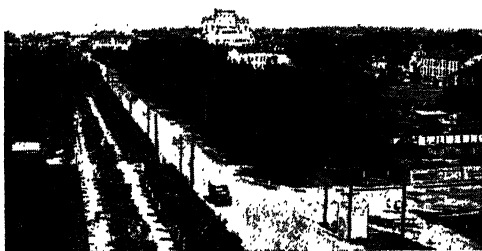
Tommy Gun. Popular name for the weapon described under Thompson Automatic Rifle.

Tompion, THOMAS (1638-1713). English clockmaker. Born at Northhill, Beds, he left his father's forge to set up as a young London watchmaker in Water Lane, Blackfriars. Exploiting Hooke's new balance spring for watches and anchor escapement for clocks, and Barlow's striking-work and cylinder escapement, he raised a hitherto undistinguished craft to a high level, treating movement as more important than exterior casing. His first fine watch, made for Charles II, brought him royal favour and a commission from the French dauphin. Examples of Tompion's art are to be seen at

Buckingham Palace, in many museums and country houses, and in wayside taverns, still in perfect working order. A small one-year striking clock, now in private ownership, made for William III at a cost of £1,500, still strikes the hours and quarters. George Graham, inventor of the dead beat escapement, was Tompion's favourite pupil.

Tom Sawyer, ADVENTURES OF. Story by Mark Twain, first published in 1876. Full of rollicking humour, this story of an American boy and his chum Huckleberry Finn (*q.v.*) gives a delightful picture of American village life in the mid-19th century, and has taken its place among the best novels dealing with boys. There have been two notable film versions, one seen in 1932 with Jackie Coogan as Tom, the other in 1938.

Tomsk. City of W. Siberia, R.S.F.S.R. Capital of a region of the same name, it stands on the Tom, a tributary of the Ob, and a branch line of the Trans-Siberian rly., about midway between Omsk and Krasnoyarsk. Vehicles and aircraft are produced, candles, soap, and spirits prepared, and there is a carrying trade on the river, mostly agricultural products



Tomsk, Siberia. General view showing the Timirjasev Prospekt

and the lead, copper, and iron yielded by the region. Tomsk university dates from 1888. Pop. 141,215.

Tom Thumb. Title of a fairy story by Charles Perrault (*q.v.*). It tells of the adventures of a man no bigger than his father's thumb. The name has frequently been given to dwarfs, the best known being Charles Sherwood Stratton (1838-83), or General Tom Thumb. He was born at Bridgeport, Conn., and was exhibited in England by Barnum in 1844, and again in 1857; on the first visit, 2 ft. high and dressed in adult attire, he appeared, by command, before Queen Victoria. He subsequently grew to 40 ins. In 1863 he married Lavinia Warren, another dwarf.



Tom Thumb. Charles S. Stratton and his bride, Lavinia Warren

He died at Middlesborough, Mass., in 1883. His widow (d. 1919) married Count Magri, the Italian "Tom Thumb," 37 ins. high, who died Nov. 1, 1920. *See Dwarf*.

Ton. Measure of weight and capacity. The British ton is 20 cwt. of 112 lb. or 2,240 lb. avoirdupois. The U.S. ton, or the short ton, is 2,000 lb. and the corresponding hundredweight is 100 lb.; when the British measure is used in the U.S.A. it is called the long ton. The metric ton is 2,204.6

lb. The term is also used to express a given amount of timber, gravel, coke, lime, etc., e.g. a load or cubic yard of gravel is a ton. The word ton is related to tun (*q.v.*), a cask or barrel, from which is derived tonnage (*q.v.*).

Tonale. Alpine pass in N. Italy. It lies almost mid-

way between the Ortler Spitz and Mt. Adamello and connects the valley of the Noce, a tributary of the Adige, in the Trentino, with the valley of the Oglio, Val Camonica. It rises to 6,181 ft. and carries a road between railheads at Malé and Edolo.

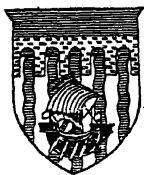
Tonalite. Group of plutonic igneous rocks akin to diorite. They consist chiefly of quartz, orthoclase, plagioclase, hornblende, and biotite. Tonalite resembles dark granite in general appearance, and is so called from its occurrence, near Tonale (*v.s.*) in the Alps.

Tonawanda. City of New York, U.S.A., in Erie co. It stands on the Niagara river, 10 m. by rly. N. of Buffalo, and is served by the International and the New York Central

riys. and the Erie canal. Settled in 1808, Tonawanda became a city in 1903. It is a rly. centre, has a harbour accommodating lake steamers, and makes office furniture and motor boats. There are Polish, Syrian, and Italian workers in a pop. of approx. 13,000.

Tonawanda, North. City of New York, U.S.A., in Niagara co. It stands on the Niagara river, opposite Tonawanda, and is served by the Erie and other rlys. and the Erie Canal. A bridge across Tonawanda Creek connects it with the twin city. A large trade in lumber and iron is carried on; manufactured products include nuts and bolts, gas engines, and furniture; and the Wurlitzer plant produces most church organs and mechanical pianos in the U.S.A. Settled in 1809, North Tonawanda was incorporated in 1865, and became a city in 1897. Pop. 20,254.

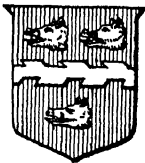
Tonbridge. Market town and urban dist. of Kent. It stands on the Medway, here crossed by a



Tonbridge arms

stone bridge, 29 m. S.E. of London, and is a rly. junction. The chief buildings are the public school (v.i.) and the church of SS. Peter and Paul, restored in 1880. The gateway of the castle remains, and the Chequers Inn is a timbered building of the 16th century. Industries are printing, tar distilling, chemical production, saw milling, and making cricket balls. The council owns sports and recreation grounds, and there are boat-ing facilities. Tonbridge grew up around the castle, which, built by Richard, earl of Clare, about 1100, remained a stronghold until the time of the Civil War. Pop. approx. 20,000.

Tonbridge School. English public school in Kent. Its foundation in 1553 was due to Sir Andrew Judd, lord mayor of London in 1550, and it was then a grammar school for boys of the neighbourhood. Its endowment, consisting largely of property in London, in the 19th century it developed into a large public school. It has classical and modern sides, and science and engineering are taught. The governing body is the Skinners'



Tonbridge School arms

Company (q.v.). *Consult* History, D. C. Somervell, 1947.

Tondern. Town of Denmark, in Jutland. Once a seaport, it now stands 8 m. from the coast on the Widane, its port being Hoyer. There is a trade in horses and agricultural produce. Being in Slesvig, Tondern was part of Denmark until 1864. From 1864 to 1918 it was Prussian, being restored to Denmark after the peace treaty of 1919. Pop. 6,778.

Tone. Term used in various senses. In music it is strictly an interval, the notes of which have vibrations in the proportion of either 8-9 (major) or 9-10 (minor). (See Mode.) The word is also a synonym for quality, e.g. the tone of a violin. In an analogous sense tone in painting stands for the general colour of a picture.

Tone or **TONEGAWA.** River of Honshu Island, Japan. One of the most important arteries in the country, it flows E.S.E. through a succession of lagoons and enters the Pacific at Choshi after a course of 173 m. River steamers connect Choshi with Tokyo by means of a distributary, the Edogawa, which enters Tokyo Bay.

Tone, THEOBALD WOLFE (1763-98). Irish patriot. Born in Dublin, June 20, 1763, the son of a coach-

ernment to send several small raiding expeditions, which all miscarried. Tone held a commission



T. Wolfe Tone, Irish patriot

in one of those, and the ship which he was aboard was compelled to surrender to an English squadron near Lough Swilly. Tone was taken prisoner, and sentenced to be hanged, but anticipated his fate by cutting his throat, dying Nov. 19, 1798. See *United Irishmen. Consult* Autobiography, ed. R. B. O'Brien, 1893; *Life Story*, A. de Blacam, 1935.

Tong. Name of several parishes in England. Tong, in Shropshire, 3 m. E. of Shifnal, is associated in fiction with the Little Nell of Dickens's *Old Curiosity Shop* (consult *A History of Tong*, Shropshire, G. Griffiths, 1894), and is famous for its Perpendicular church, S. Bartholomew's, founded about 1410, restored 1892, containing a 16th century chapel with fan-vaulted roof and tombs of the Vernon, Pembridge, Stanley, and other families. The existing Tong Castle dates from 1785. Tong, or

Tonge, in Kent, 2 m. W. by N. of Sittingbourne, is notable for its church, S. Giles's, restored 1883, which has a 13th century tower and a 14th century roof. Tong, in the W. Riding of Yorks, is 8 m. S.E. of Leeds.

Tonga Islands. British protectorate in the S. Pacific Ocean, more usually known as



Tonbridge, Kent. Ruined gateway of the Norman castle, built during the reign of Henry I and much enlarged in the 15th century

the Friendly Islands (q.v.).

Tongaland, AMATONGALAND, OR MAPUTALAND. Dist. in the N. of Natal. It borders upon Zululand, Swaziland, and Mozambique. In 1890 it was proclaimed part of Zululand; in 1895 a British protectorate was declared over the territory, and in 1897 it was incorporated with Natal. Its area is about 1,200 sq. m., and the pop. is about 13,000. The Amatongas are also settled on the N. side of the Portuguese frontier, fixed by the Anglo-Portuguese Convention of June 11, 1891. See Natal.

maker, and educated at Trinity College, Dublin, he was called to the bar, but preferred to devote his energies to politics. Under the influence of the ideas of the French Revolution he formed the soc. of United Irishmen in 1790. Arrested for treason, Wolfe Tone was allowed to leave the United Kingdom, and made his way from America to Paris, where in 1796 he persuaded the French government to undertake the Irish expedition under Hoche which ended in failure. In 1798 Tone again persuaded the French gov-

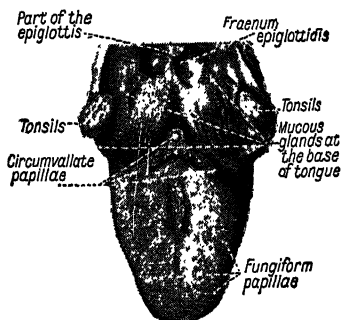
Tongariro. Extinct volcanic cone, in North Island, New Zealand. Near Lake Taupo, it rises to 6,140 feet. Here is a national park.

Tongking. Historic name of N. Vietnam. Formerly a province of the kingdom of Annam, it became a French protectorate in 1883-85. It comprises the lower portion of the basin of the Hong-Kiang, and lies between China and Central Vietnam (Annam), with 40,430 sq. m. The N. is mountainous, where the forest yields teak; the S., comprising the delta of the Hong-Kiang and the shores of the Gulf of Tongking, is flat, marshy, and frequently flooded. Rice, sugar, tobacco, ramie, tin, coal, and silk are the principal products. Hanoi (*q.v.*) is the capital. There is a rly. from Hanoi to Saigon. Pop. 9,920,000. See Indo-China.

Tongking, GULF or. Arm of the S. China Sea. It is 300 m. by 150 m., and receives the waters of the Hong-Kiang. The island of Hainan blocks half the mouth between the Kwangtung peninsula and the Annam coast.

Tongres or **TONGREEN.** Town of Belgium, in the prov. of Limburg. It lies on the river Geer, 18 m. by rly. N. of Liège, and is a rly. junction. There are industries in wood, paper, umbrellas, brewing, pottery, tiles, and tanning. The church of Notre Dame, a 4th century foundation, dates mainly from the 13th century, and has an earlier chapter house of note. The town's name comes from the German tribe called by the Romans the Tungri. It has suffered many sieges and much destruction. Sacked by Normans in 822, it was captured by French armies in 1672, 1703, 1746, and 1794, when it remained in French hands until 1814. Pop. est. 11,500.

Tongue. Muscular organ placed on the floor of the mouth. The base of the tongue is connected with the



Tongue. Upper surface of the human organ, showing papillae and adjacent parts

hyoid bone, the epiglottis, the pillars of the soft palate, and the pharynx. The organ is covered with a mucous membrane with numerous papillae distributed over the anterior two-thirds of the upper surface.

These are of three varieties: circumvallate, eight or ten in number, placed in a V-shaped line at the back of the tongue, and from 1/20th to 1/12th of an in. across; fungiform, scattered mainly over the sides and top; and conical or filiform, scattered over the whole of the upper surface.

The sense of taste is situated chiefly in the circumvallate and fungiform papillae, while the conical or filiform papillae have mainly a mechanical function. Minute structures known as taste-buds are found in the circumvallate papillae and scattered over the posterior third of the tongue and palate. These contain gustatory cells surrounded by minute nerve fibres.

The tongue is supplied by three nerves: the lingual, which conveys tactile sensation; the glossopharyngeal or nerve of taste; and the hypoglossal, which is distributed to the muscles. The mucous membrane on the under surface of the tongue is smooth and thin. In the central plane it forms a fold, the *frenum linguae*. The tongue has important functions in connexion with mastication, deglutition (swallowing), and articulation. The surface of the tongue gives much information to the physician. It is dry in fever and acute illness; it is furred in many types of gastro-intestinal disorder. Cancer and syphilitic involvement are the worst diseases of the tongue. See Anatomy; Glossitis; Hyoid Bone.

Tonic. Any remedy which restores tone to a depleted bodily system or organ. The term is necessarily vague and covers also treatment not making use of drugs. Strychnine and the phosphates may be cited as tonics for the nerves; dilute hydrochloric or nitric acid for the stomach; while arsenic and iodide are known as alteratives, because they change in some subtle way the general chemistry of the body. Tonics are less frequently prescribed than they were, as they may produce a false sense of well-being.

Tonic. In music, the name of the key-note. Its effect is so conclusive that the chord built upon it ends almost all compositions.

Tonic Sol Fa. System of writing music in a letter notation. It was first used in teaching sight reading

to children by Elizabeth Glover of Norwich, but John Curwen, a nonconformist minister, was so struck with its basic soundness and simplicity that he devoted his life with singular success to improving and systematising the method. Greeted at first with much ridicule and opposition from staff-notationists, its principles are now recognized as sound, and its use has become extensive, especially in teaching sight singing.

It takes as its basis the major scale and the tonal relationships of the notes thereof. These are named Doh, Ray, Me, Fah, Soh, Lah, Te, and Doh, the key being stated. The minor scale is taught as an adjunct of the major, and is called the Lah mode. Sharpened notes always have the vowel "e," e.g. the raised fourth is called Fe: flattened notes have the vowel "a" (pron. aw), so that the lowered seventh is Ta. In modulation, bridge tones are used, and the Doh changed according to circumstances. A chart called the modulator shows all these bridge tones. The complications of time notation are largely swept away by a complete system of time-names borrowed from the Galin-Paris-Chevé method, thus enabling the permutations of beat values to be practised vocally. All measures are made of equal spacing. Although Tonic Sol Fa has its limitations, it has indubitably played a large part in the diffusion of musical knowledge. See Aretinian Syllables; Notation.

Tonic Sol Fa College. Institution founded in 1863 by the Rev. John Curwen to conduct examina-



Tonic Sol Fa. Central portion of modulator, keys in F, C, & G. Modulator extends from C flat to C sharp. By courtesy of J. Curwen & Sons, Ltd.

tions and to provide music-teaching on Tonic Sol Fa lines, though the staff notation is also used. Incorporated in 1875, it has offices at 9, Queensborough Terrace, London, W.2. It holds classes, especially for the training of teachers, and grants certificates, as well as the diplomas of associateship, licentiate, and fellowship. In 1944 the name was changed to Curwen Memorial College.

Tonk. City and former state of India, now in the union of Rajasthan. The state comprised several detached areas in the E. of Rajputana, one of which is almost entirely surrounded by Madhya Bharat. In 1817 the nawab disbanded his army on the condition that the Indian government confirmed him in the sovereignty of his possessions, some of which are 250 m. apart. Area 2,543 sq. m. Pop. 353,687.

Tonk city is 55 m. S. of Jaipur on the Banas-Chambal plateau, at an elevation of 1,500 ft. Pop. 39,700.

Tonka Bean or **TONQUIN BEAN** (*Dipteryx odorata*). Evergreen tree of the family Leguminosae, native



Tonka Bean. The flowers and leaves of this evergreen tree

of Guiana. It is about 60 ft. in height, and has alternate leaves divided into five or six leaflets. The violet-purple flowers are clustered, and are succeeded by short pods containing a single fragrant bean, which is used for scenting snuff, sachet powders, etc.

Tonks, HENRY (1862-1937). British painter. Born at Solihull, he was educated at Clifton, and adopted the medical profession, becoming in turn house physician and surgeon at London Hospital and house surgeon at the Royal Free Hospital. Then he studied painting under Fred Brown at Westminster school of art, and when Brown was made Slade professor of fine art at University College, Tonks became his assistant at the Slade school, succeeding to the chair in 1917 and remaining until 1930. Among his pupils

were Orpen, Chesterton, and Augustus John. Associated with the New English art club from 1891, he painted characteristically The Knitting Party, The Bird Cage, and Saturday Night in the Vale. His Self-Portrait, and other works, are at the Tate Gallery. He died Jan. 8, 1937. *Consult Life, J. Hone, 1939.*

Tonle Sap. Lake of Cambodia, Indo-China. It acts as a regulator of the Mekong. During the wet monsoon it has an area of 120 sq. m. and a depth of 50 ft., receiving flood waters of the Mekong through the Me Sap. In the dry season it shrinks to some 80 sq. m. and a depth of 2 ft. About 30,000 people are occupied in the extensive fisheries. When the depth permits, navigation is maintained between Saigon and Battambang.

Tonnage. Term used to describe the measurement of the capacity, or volume, of a ship expressed in units of 100 cu. ft., the unit of such volume being called a ton measurement. The nautical ton is derived from the tun, a measure of liquid capacity equivalent to 252 galls. Originally a wine measure, this was used in the Mediterranean, where carrying capacity of medieval ships was rated according to the number of 252-gall. casks of wine they could stow. Four filled tuns weighed approx. one ton avdp.

By international agreement, ships are measured to specific tonnages for registration and identification, and to form a basis for the payment of charges levied by harbour, pilotage, canal, and lighthouse authorities. Among principal measurements, dead-weight tonnage is the weight in tons avdp. of cargo, passengers, fuel, and stores carried by a fully laden ship; this is the difference between the weight of a vessel and its machinery and the weight of the ship and contents when laden. Capacity tonnage is the total internal capacity of a ship below the main deck. Gross tonnage is the sum of capacity tonnage and all enclosed spaces above the main deck. Net or registered tonnage is gross tonnage less the capacity of non-cargo or non-passenger load earning space. Freight tonnage is the total cubic capacity available for cargo, and is expressed in tons of 40 cu. ft., that figure being assumed equivalent to one ton avdp. Displacement tonnage represents the ship's laden weight in tons avdp.; it is so called because fixed by calculating the weight of the water

displaced by the ship when immersed to its loadline.

Tonnage and Poundage. Customs duties formerly levied at the English ports. The duty was imposed on every tun of imported wine and at twelve pence on every pound's worth of other goods passing into or out of the country. An early form of this was raised by agreement in 1347, and the proceeds went to the crown, nominally for purposes of defence. In 1373 parliament granted the crown the right of raising it for a limited period, from the time of Edward IV for the sovereign's lifetime. In 1628 Charles I claimed the raising of tonnage and poundage as his right, although it had not been granted by parliament. The duty was granted to Charles II in 1680, and made perpetual under Anne, but was abolished under George III, 1787, when excise and customs were organized on a new basis. *See Customs.*

Tonnage Dues. Charges paid by vessels on entering port. They are calculated upon the registered net tonnage of a ship, this being its gross tonnage less allowances for the space occupied by the machinery, etc. They are devoted to the upkeep of the harbours and the maintenance of buoys, lights, etc. Tonnage dues are also charged upon ships passing through the Suez, Panama, and other canals. *See Panama Canal; Suez Canal.*

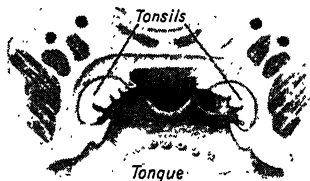
Tono-Bungay. Novel by H. G. Wells, published 1909. It presents a comprehensive study of the then contemporary English social scene, in the form of the personal narrative of George Ponderevo. Tono-Bungay is the name of a patent medicine invented and marketed by Ponderevo's uncle, a small chemist, to whom it brings fortune and power, and ultimately bankruptcy and death.

Tonometer. Contrivance for the exact measurement of musical pitch. As originally constructed by its inventor, J. H. Scheibler, it consisted of 52 tuning-forks laboriously corrected by counting the beats, and by comparison with the results obtained from the monochord, so as to provide an accurately tuned scale from any given pitch. This device is no longer in existence, but there is one with 56 forks, which also belonged to Scheibler. The value of each of these forks was given by A. J. Ellis in the *Journal of the Society of Arts*, March 5, 1880.

Tönsberg. Fortified seaport of Norway, in Vestfold co. It stands on an arm of Oslo Fjord, 71 m.

by rly. S. of Oslo. One of the oldest settlements in Norway, it has special interests in the Arctic whale and seal fishery. Jarlsberg is a ruined fortress and royal residence in the neighbourhood. Pop. 11,388.

Tonsil (Lat. *tonsilla*, a stake). Name of two prominent rounded glandular organs situated between



TONSIL. Diagram showing position of tonsils at back of the mouth

the pillars of the soft palate at the back of the mouth. The tonsils consist mainly of lymphoid tissue, and are covered with mucous membrane. They are often removed when the seat of septic infection, especially in children; and because they are often associated with adenoids (*q.v.*). Unhealthy tonsils in the adolescent or adult are usually the result of septic material draining into them from the roots of the teeth.

Tonsillitis. Inflammation of the tonsils, through their invasion by micro-organisms. When accompanied with suppuration within and around the tonsil, the condition is known as quinsy. Treatment consists in the administration of a purge, a hot carbolie gargle, and the sulpha group and penicillin, which dispose of the germs causing the inflammation. Hot fomentations on the neck and throat often give relief. When suppuration occurs, incision is necessary.

Chronic hypertrophic tonsillitis occurs in weakly children, often in association with adenoids. The tonsils are enlarged, breathing through the nose is restricted, and the child usually breathes with the mouth open. In mild cases, change of air, administration of iron and cod-liver oil, and painting the tonsils with glycerine or tannic acid may possibly be sufficient. If these measures are not successful, the tonsils should be removed by dissection, together with the adenoids, an operation which is not attended with much risk.

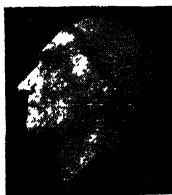
Tonson, JACOB (c. 1656–1736). English publisher. He started business at the Judge's Head, Chancery Lane, London, in 1678, moved later to Gray's Inn Gate, where his brother Richard had opened a

bookshop in 1676, and then to the Shakespeare's Head in the Strand. He became printer of parliamentary votes, was secretary of the Kit-Cat Club, and is remembered as publisher of Milton's *Paradise Lost*, Rowe's Shakespeare, and works by Dryden, Addison, and Steele. Retiring in 1720, he died April 2, 1736. His nephew, Jacob Tonson II (d. 1735), was his partner after 1712, and his great-nephew, Jacob Tonson III (d. 1767), later carried on the business.



Jacob Tonson, English publisher

Tonsure (Lat. *tondēre*, to shear). In eccles. usage, the ritual shaving of the head, or a part of the crown, as a sign of admission to the clerical state and preliminary to taking holy orders. As a mark of the clergy it dates probably from the late 5th century, though it was used by the monks at an earlier date. The Roman, or S. Peter's, tonsure was of the whole head, except a narrow circle of hair; the



Tonsure of old Roman type

Eastern, or S. Paul's, of the whole head; the Celtic, or S. John's, the head in front of a line drawn from ear to ear. In practice, it is usual for only a small circle on the crown of the head to be shaven. See Monasticism.

Tontine. Method of life insurance. It owes its name to an Italian banker, Lorenzo Tonti. The main idea is that a number of persons contribute to a fund with which property is bought; the income is portioned between them, but as each one dies his share is divided between the others until the whole is enjoyed by the last survivor. In 1689 a loan was raised in France by a tontine. A number of persons paid 300 livres each, and the survivor of them received ultimately an income of 73,500 livres. After this there were a number of private tontines in France. In Great Britain, towards the close of the 19th century, the govt. raised money by means of tontines, and the idea also found favour in the U.S.A. R. L. Stevenson used the idea in *The Wrong Box*.

Tooke, JOHN HORNE (1736–1812). English politician. Son of

John Horne, a London tradesman, he was born June 25, 1736, and educated at Westminster, Eton, and S. John's College, Cambridge. Ordained in 1759, he held the cure of New Brentford, 1760–73. Entertaining strong political views, he became an adherent of John Wilkes, with whom, however, he quarrelled in 1771. The same year he agitated for and obtained the printing of parliamentary reports. In 1777 his acknowledged sympathy with the N. American colonists was punished by fines and imprisonment. He assumed the name of his friend and patron, William Tooke, in 1782.



Acquitted of a charge *John Horne Tooke* of high treason brought about by his sympathy with the French Revolution, 1794, he was elected M.P. for Old Sarum in 1801, but was excluded by an Act passed immediately after, disqualifying the clergy from sitting in parliament. He died March 18, 1812.

In addition to sundry political tracts, Tooke published a philological work, *Epea Pterocenta*, or the Diversions of Purley, 1786–1805. *Consult* Lives, J. A. Graham, 1898; M. C. Yarborough, 1927.

Toole, JOHN LAWRENCE (1832–1906). British comedian. Born in London, March 12, 1832, he was



J. L. Toole

educated at the City of London school, and was for a time employed by a wine merchant. In 1852 he made his first stage appearance in *The Spitalfields Weaver* at Dublin. In 1854 came his début in London—at St. James's Theatre—and by 1859 he was the leading comedian at The Adelphi. During 1869–74 he was at The Gaiety; then, after a visit to the U.S.A., he became proprietor of the Folly Theatre, which, as Toole's, had a successful period during 1882–93. One of the best of his later parts was in Walker, London, 1892. Toole retired in 1893, and died at Brighton, July 30, 1906. *Consult* his Reminiscences, 1889.

Tooley Street. London thoroughfare. It runs S.E. from London Bridge to St. Saviour's

Dock. Near the bridge is S. Olave's church, founded about 1300, rebuilt 1737-39, and restored after a fire in 1843. Near the junction with Queen Elizabeth Street is the grammar school of S. Olave and S. Saviour, for boys, founded 1671, and rebuilt 1835, 1850, and 1892-96, with a branch school for girls in New Kent Road. The name of the street, which was the scene of a great fire on June 22, 1861, and a serious air raid incident, Nov., 1940, when a German bomb fell on a shelter, causing many fatal casualties, is a corruption of St. Olave's Street. (See Olaf II.) The thoroughfare is famous for a story by Canning of "the three tailors of Tooley Street," who began a petition to the house of commons, "We, the people of England."

Tool Steel. Strictly speaking, steel used for tools. So-called tool steels are, however, also used for other purposes, e.g. springs to stand high temps. Such steels have a high carbon content, carbon tool steels containing up to about 1.4 p.c., to give hardness and resistance to abrasion. If required to retain hardness at elevated temps., as in steels for high-speed tools, other additions, e.g. tungsten, chromium, vanadium, cobalt, are made. The steels are manufactured in small quantities from carefully selected iron, e.g. Swedish iron. After casting into small ingots, the steels are hot-forged to break up the cast structure, hardened by quenching, and tempered. See Steel.

Tooth. One of the hard structures in the jaws of animals. Anatomically and functionally it is described under Teeth.

Toothache. Pain associated with diseases of the teeth, most often due to caries or decay. When nothing is involved but the dentine, which lies beneath the enamel or hard exterior covering of the tooth, the pain is not very severe, but if decay is extended to the deeper pulp of the tooth, the pain may be intense. Inflammation and swelling of the gums are often present in addition. The only satisfactory treatment is to have the tooth stopped, with or without killing the nerve, or if decay is too far advanced, to have it extracted. The pain may be relieved by placing a small piece of cotton-wool in the cavity of the tooth, soaked in camphorated chloroform, or, in severe cases, a strong solution of carbolic acid. If the latter is used, care must be taken to avoid touching the lips

or gums with the carbolic acid. See Caries; Dentistry; Teeth.

Tooth-Mutilation. Dental disfigurement effected under social sanction among primitive peoples,



Tooth-Mutilation as practised by Batwa pygmies
American Field Museum, Chicago

especially in Africa and S.E. Asia. An artifice designed to improve on nature, having an amuletic origin, it became a mode of personal decoration and ornament, or a means of marking superiority to despised peoples, and unlikeness to monkeys and dogs. Effected by extraction, chipping, filing to a point or a notched edge, inlay, colouring, and deflection, it often forms an essential element in the rites of initiation into adult life. It is widespread in negro Africa.

In S.E. Asia, under Malay influence, filing, as practised by the Borneo Dyak, Philippine Bagobo, and Javanese, is often associated with or replaced by inlaid brass wire, gold studs, or gemstones. This custom existed in ancient Mexico and Peru: a skull unearthed in Ecuador had gold disks in five incisors. The blackening prevalent in Indo-China and elsewhere, a secondary result of betel-chewing, is sometimes enhanced by other vegetable dyes. At some Australian initiation rites, one lower incisor is knocked out.

Tooth Ornament. In architecture, a decorative design consisting generally of a row of small sculptured four-leaved flowers, embedded in a hollow moulding (q.v.). Probably of Eastern origin, it became a favourite decoration of the Romanesque and E.E. styles. See Dog-tooth Ornament.

Toothwort (*Lathraea squamaria*). Perennial root parasite of the family Orobanchaceae, native of Europe and Asia. It has a thick fleshy white rootstock whose rootlets are attached to those of its victim, chiefly hazel. The stout whitish stems are from four to ten ins. high, with broad

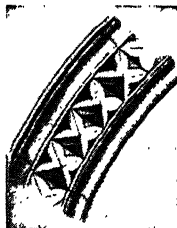
pinkish scales in lieu of leaves, which are folded back upon themselves, enclosing several chambers whose walls are studded with stalked glands. The function of these glands is not definitely known, but it is thought that they help in secreting water. The purple-tinged flowers are also fleshy, and crowded on a one-sided spike. See Root Parasites.

Tooting. Dist. of S.W. London, forming from 1950 part of the bor. constituency of Wandsworth Central. Partly residential and partly industrial, it is divided into Upper Tooting or Tooting Bec, and Tooting Graveney or Lower Tooting. Tooting Graveney and Tooting Bec commons, 63 acres and 154½ acres respectively, were acquired for the public in 1873-75, and now form a large open space under the control of the L.C.C. The place was named Totings in the 8th century, probably from the Saxon name Tota. The parish church of S. Nicholas was put up in 1833 on the site of the old Saxon building of that name mentioned in Domesday; it has been enlarged, but has still monuments belonging to the early church. Holy Trinity church, 1855, serves part of Tooting Bec, which was named after land given to the abbey of Bec in the time of William the Conqueror. In the district are Lambeth and Streatham cemeteries, S. Clement Danes almshouses, Springfield and Tooting Bec mental hospitals, Grove fever hospital, and Wandsworth infirmary. It is served by trams, buses, rly., and underground rly. Defoe is believed to have preached in Tooting. Pop. 38,175.

Toowoomba. City of Queensland. It is the chief inland place on the Darling Downs, 1,920 ft. alt., 100 m. W. of Brisbane on the main rly. to Sydney. The "gateway of the west" and a notable health resort, it is an agricultural centre, with butter, cheese, and bacon factories, foundries, and rly. works. Pop. 33,326.

Toparé. Modern name for Pollanarua, an ancient capital of Ceylon. It is situated in the N. Central prov. about 60 m. N.E. of Kandy, and was the capital between 769 and 1235. Most of the ruins belong to the period 1153-86, the reign of Prakrama Bahu I, who fortified the place and built a palace, monastery, and other public buildings near the artificial lake Toopawewa.

Topaz (Gr. *topazos*). A mineral; aluminium fluosilicate. Yellow, green, blue, or red in



Tooth Ornament in architecture

colour with a glassy lustre, it yields fine varieties which are valued as gem stones. It is found in gneiss or granite and associated metalliferous veins, and is frequently associated with tinstone, tourmaline, mica, beryl, etc. The deep orange yellow topazes are most valued, and the finest stones have been found in the Ural Mts. and Brazil. Some Brazilian stones become pink on heating and are used in cheap jewellery. Many so-called topazes are really only yellow varieties of quartz. See Precious Stones.

Tope (*Galeus canis*). Species of small shark. It is found in most of the tropic and temperate seas, and often occurs round the British coasts. It is about six ft. long and is grey on the back and whitish beneath. It spends most of its time on the bottom of the sea, feeding on fish, crustaceans, and echinoderms. See Shark.

Tope. In Buddhist architecture, a dome-shaped monument, solidly built, for the preservation of relics. Topes may have a polygonal, round, or square base, and are generally crowned by a finial (*q.v.*), called a tee. Those in Ceylon are called *dagobas*; the Ambustella Dagoba, Mihintala, is one of the most famous. When a dagoba has a definite commemorative purpose, it is known as a Stupa. Topes are usually enclosed within a stone railing or other barrier.

Topeka. Capital and third largest city of Kansas, U.S.A. The co. seat of Shawnee co., it stands on the Kansas river, 65 m. W. of Kansas City, and is served by the Atchison, Topeka, and Santa Fé rly. and other systems. Washburn College is the chief educational institution. The American home is symbolised by a huge terra-cotta sculpture over the door of the state capitol (1924). The Loan Association Building is notable. Topeka has extensive rly. workshops, flour mills, machine shops, and foundries, and manufactures butter and woollen goods. Organized in 1854, it became the capital in 1861. Its city charter was granted in 1881. Pop. 67,833.

Topelius, Zachris (1818-98). Finnish author. Born Jan. 14, 1818, he was educated at Helsingfors (Helsinki). For a time he edited the Helsingfors News, in which many of his early stories and poems appeared, and was professor of history at his own university, 1853-78. His works include nature stories for children, translated into

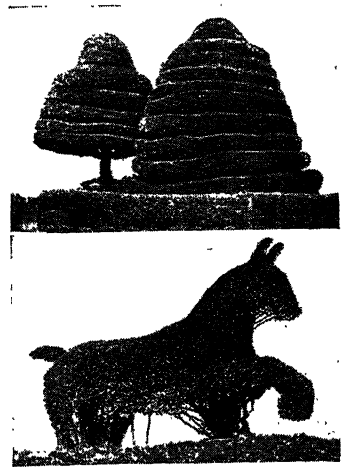
English as *Whisperings in the Wood*; a series of historical tales; *Stories of the Surgeon*, 1858-67, also translated; a play, *After Fifty Years*; and poems. He died at Helsingfors, March 13, 1898. His collected works appeared at Stockholm in 30 vols., 1899-1910.

Topheth or **TOPHET**. Word allied in sense to the Heb. Sheol, and the Gr. Gehenna and Hades. It is applied to the Valley of Hinnom (2 Kings 23, v. 10), where idolatries were practised, and where later the refuse of Jerusalem and the bodies of animals and criminals were burned. An expression of abhorrence, its literal meaning is spittle or spitting, and it is used as a synonym for Hell (*q.v.*).

Topiary (Lat. *topiarius*, landscape gardener). The practice of clipping and cutting trees and shrubs into regular forms, human figures, animals, peacocks, cups and saucers, etc. Modern custom confines topiary work to solitary specimens, often grown in tubs, and specially trained; but at some country mansions, notably Levens Hall in Westmorland, and Elvaston in Derbyshire, whole topiary gardens of mature trees, in some instances over 100 years old, are maintained. The trees which lend themselves most readily to clipping are box, yew, and holly. Topiary clipping needs an accurate eye and a steady hand, as a false move of the shears will often spoil the symmetry of a tree for a whole season. See Terrace Garden.

Toplady, AUGUSTUS MONTAGUE (1740-78). English hymn writer. Born at Farnham, Surrey, and educated at Westminster School and Trinity College, Dublin, he was ordained in 1762, and in 1768 exchanged the living of Harford for that of Broad Hembury, Devon. A

convinced Calvinist, he embodied his views in *The Historic Proof of the Doctrinal Calvinism of the Church of England*, 1774, and engaged in bitter controversy on the subject with John Wesley. He also wrote sacred poems, but is remembered only for hymns, including the world-famous *Rock of Ages*, first published in the *Gospel Magazine* in 1775. The story is that he was inspired to write this while shelter-



Topiary. A hawthorn bush clipped to a life-size design of a horse. Top, two trees, each more than 100 years old, cut with a series of independent rings

ing from a storm in a cleft of limestone rock at Burrington Combe in the Mendips. Toplady died Aug. 14, 1778.

Topography (Gr. *topos*, place; *graphein*, to write). Art or practice of geographical description, i.e. giving the situation, natural features, buildings, etc., of a country; also describing rivers, mountains, etc. Books containing this information are known as *gazetteers*. See Geography; Maps.

Topolobampo. Seaport of Mexico, on the Gulf of California, in the prov. of Sinaloa. It is served by the Southern Pacific rly. and is rapidly being made into a first-class shipping base with the natural advantages of its position on Topolobampo Bay. The district is famous as a sportsman's paradise. Pop. 10,000.

Topolski, FELIKS (b. 1907). Polish-born British artist. Born Aug. 14, 1907, he studied painting at Warsaw academy of art, and contributed cartoons to Polish periodicals. He settled in England in 1935, when he published *The London Spectacle*; became a skilled draughtsman and painter; and was appointed an official war artist, depicting scenes from the battle of Britain. As a cartoonist he had a lively sense of the grotesque that made his pen and wash drawings popular. He illustrated



A. M. Toplady,
English hymn-writer



Feliks Topolski,
British artist

editions of Bernard Shaw's plays *Geneva*, *In Good King Charles's Golden Days*, and *Pygmalion*. He is represented at the British Museum and the Tate Gallery.

Topsail. In a square-rigged ship, the sail next above the lowermost one on the mast. Modern ships have often an upper and a lower topsail. *See Ship*; *Spinnaker*.

Tor. Striking, and sometimes fantastic, tabular, or pillow-shaped rocky elevation. Found typically in granite regions which have been long exposed to weathering, tors number some 170 on Dartmoor, the highest being High Wilhays and Yes Tor (over 2,000 ft.).

Torah (Heb. *ha-torah*, law). Term applied in the Jewish religion to the Pentateuch. There are two torahs recognized in Hebrew teaching: the Mosaic torah or written law, as embodied in the Pentateuch; and the oral torah, embodied in the Mishna (*q.v.*). *See Hebrew Religion*; *Pentateuch*; *Talmud*.

Torbanite. Shaly rock which will yield oil on heating and which is related to the boghead coals, cannel, etc. The organic matter is characterised by a preponderance of algal remains mixed with plant debris. Torbanite derives its name from the Torbanehill estate in the Lothians of Scotland, where it was first worked. Important deposits occur in S. Africa, Brazil, New South Wales, Nova Scotia, and New Brunswick.

Torbernite or **COPPER URANITE.** In mineralogy, a hydrated phosphate of copper and uranium, sometimes containing a little arsenic. This is a brilliant green mineral found in scaly or foliaceous crystals, often associated with uraninite, the chief source of uranium. Torbernite is always a secondary alteration product of primary uranium-bearing minerals.

Tor Bay. Almost semicircular inlet on the S.E. coast of Devon, England. It is $\frac{1}{2}$ m. across between Hope's Nose and Berry Head, and penetrates $3\frac{1}{2}$ m. inland. On its shores are Torquay, Paignton, and Brixham, where the prince of Orange landed, Nov. 5, 1688. Except when the E. wind blows, the bay provides safe anchorage and is frequented by yachts. *See Brixham*; *Paignton*; *Torquay*.

Torc or **TORQUE** (Lat. *torquis*, necklace). Personal ornament of one or more metal bars or bands, spirally twisted. Devised by the early Persians and Scythians, twisted necklets come sparingly from Bronze-Age lake-dwellings; similar gold armlets occur in Scotland (Moor of Rannoch; Urquhart).

In the early Iron Age they became a national ornament of the Celts. Manlius removed one from a vanquished Gaul, whence the family name *Torquatus* (*q.v.*). The finest and most varied are Irish. Toro is also the name of a mt. and waterfall in the Killarney dist., Eire.

Torcello. Italian islet of the Adriatic Sea. It is 6 m. N.E. of Venice in the Venetian Lagoon. In the town, formerly the ancient seaport of Altinum, is the former Byzantine cathedral of Santa Maria Assunta. Founded in the 7th century and rebuilt in the 9th century, this contains valuable 12th century mosaics. Another interesting building is the 12th century church of S. Fosca. *See Venice*.

Torch. Piece of twisted wood or other combustible material soaked in an inflammable substance and, when kindled, carried by hand as a portable light (*see Link*). The modern equivalent is a cylindrical metal or plastic case fitted with bulb and battery (one or more dry cells in series, giving a voltage of 2.5-3.5). Some torches are fitted with adjusters to emit light beams up to 100 ft.

Toreador (Sp. *toro*, bull). Name given to a Spanish bull-fighter. It refers more especially to the mounted picador, as distinct from a torero, who fights on foot. *See Banderillero*; *Bull-fighting*.

Torgau. German town, in the Land of Saxony-Anhalt, after 1945 in the Russian occupation zone. It is 30 m. N.E. of Leipzig, on the left bank of the navigable Elbe. A castle, Torgow, is first mentioned in 973. Here are the late Gothic church of S. Mary (1479-1526) with the tomb of Luther's wife; the castle church (1544), first house of worship built for Protestants; a Renaissance town hall (1563-65); and the Hartenfels palace, one of Germany's most impressive Renaissance dwellings, with a collection of Saxon antiquities. Mainly residential before 1939, Torgau had some industry connected with ceramics, glass, engineering, oil, and paper. The Saxon electors made it their residence in 1456; in 1530 Luther signed the Torgau articles; and in 1760 Frederick II here defeated the Austrians (*v.i.*). Strongly fortified, Torgau was in Napoleon's hands 1810-13. Here the Allied armies invading Germany from E. and W. had their first meeting April 25, 1945, when U.S. patrols met elements of the Russian 58th Guards div. Pop. 18,000.

Torgau, BATTLE OF. Victory gained by Frederick the Great over the Austrians in the Seven Years' War, Nov. 3, 1760. Daun, the Austrian commander-in-chief, had concentrated 64,000 men and 400 guns in an entrenched camp at Torgau, and Frederick determined to attack with his force of 45,000. His plan for taking the camp in rear miscarried, and he made little progress till sunset, when his last reserves broke the Austrian line and caused a retreat. The Prussian casualties, which numbered 13,120, as compared with 11,260 on the Austrian side, included many more killed.

Tormentil (*Potentilla erecta*). Perennial herb of the family Rosaceae. A native of Europe,



Tormentil. Leaves and flowers of this perennial herb

W. Siberia, and the Azores, it has a stout, almost tuberous rootstock which is of an astringent quality and used for tanning. The stems are long, very slender, and hairy. The leaves are divided into three, or rarely five, oval wedge-shaped leaflets, and the yellow flowers have four, occasionally five, petals.

Tormes. River of W. Spain. Rising in the Sierra de Gredos, in Avila prov., it flows first N. and then W., passing Salamanca, and effects a junction on the Portuguese frontier with the Douro, of which it is a left bank trib., after a course of c. 150 m. *See Salamanca*.

Tornado. Violent and destructive local atmospheric whirl, giving winds which have been est. to exceed 200 m.p.h. on occasion. Its area averages only a few hundred ft. in diam. Tornadoes are associated with thundery conditions, the most characteristic feature being a funnel-shaped cloud hanging from the under surface of a heavy cumulonimbus cloud, and reaching to the ground. The column is rendered visible by the condensation of water vapour in it. Within the tornado



Tornado. The funnel-shaped whirl of this destructive phenomenon seen at Peshawar, April, 1933

By courtesy of W. Plesents

there is generally heavy rain or hail and thunder and lightning; its passage is accompanied by a loud rumbling sound. In the N. hemisphere the direction of rotation of the whirl is counter-clockwise and its rate of travel about 30-40 m.p.h. from the N.E.; in the S. hemisphere the motion is reversed and the direction S.E. In this, the most destructive of all meteorological phenomena, the violence of the upward currents of air causes the uprooting of trees, the removal of roofs from houses, and the lifting of animals

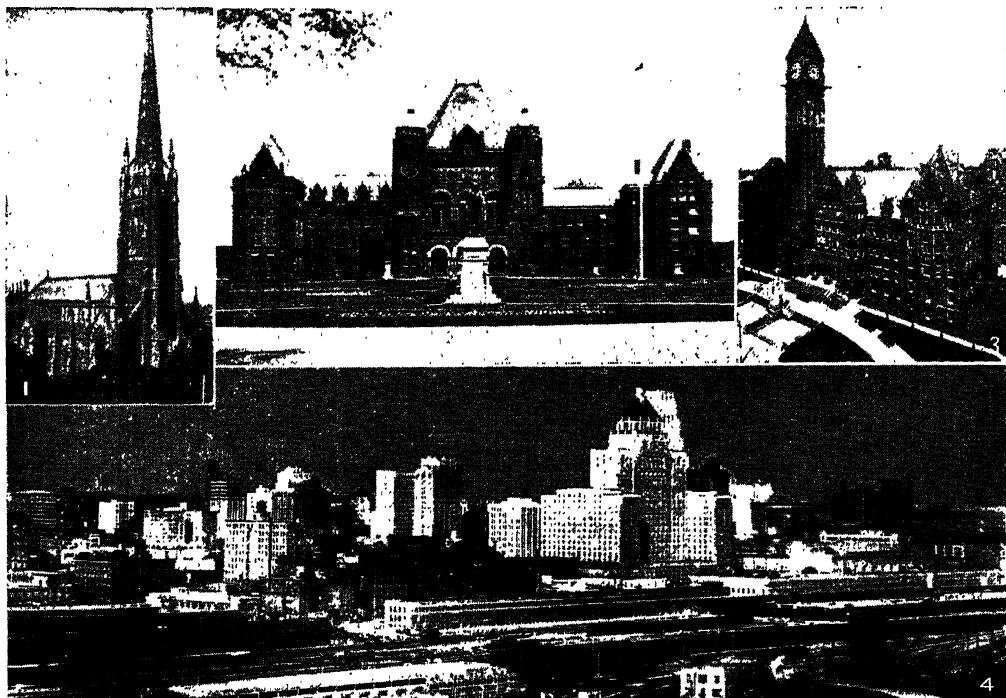
and heavy objects. Although often not lasting more than half an hour, tornadoes have been known to derail a train and destroy a village. Tornadoes are most frequent in the late afternoon in spring and summer, in the central plain of the Mississippi region. The average annual number of "twisters," as they are termed, reported in the U.S.A. during 1916-45 was 143. Similar whirlwinds occur in Australia; over the sea they are called waterspouts. In W. Africa the name is applied to a totally different phenomenon, that of the line squall associated with the front of a thunderstorm. See Squall; Waterspout; Wind.

Torneå. River of Lapland. Rising in the Torneå lake, about 30 m. E. of Narvik, it flows generally S.E., forms the boundary between Sweden and Finland, and after a course of 250 m. discharges into the Gulf of Bothnia.

Toronto. City of Canada, the capital of the prov. of Ontario. It stands on a bay of Lake Ontario, to the N. of the mouth of the Niagara river, in York co., 333 m. by rly. S.W. of Montreal. It is served by the C.P.R. and C.N.R., and from here steamers go regularly to various Canadian and American ports, the water communications with both E. and W. being extensive. There is a system of electric rlys. in the streets. Toronto has a frontage of about 10 m. on the lake. According to some authorities the name means, in Indian speech, a place of meeting; according to others, trees in the water.

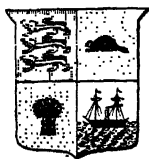
Buildings include those of the government of Ontario; the city hall, a fine, large Romanesque edifice, with an enormous clock tower; law courts in Osgood Hall; public library; and art museum, housed in the Grange. The legislature has a fine block in Queen's Park. There are R.C. and Anglican cathedrals, and many other modern churches. The Bank of Commerce building is the tallest skyscraper in the British Commonwealth, and Toronto contains the Commonwealth's largest hotel.

Educational institutions include the university of Toronto (*v.i.*),



Toronto, Canada. 1. Anglican cathedral of St. James, built in 1858. 2. Provincial Legislative building which stands in Queen's Park. 3. The City Hall, in Romanesque style. 4. The city skyline viewed across Union Station, seen right foreground

and among other colleges and schools Upper Canada College (1829) is the chief. The business and older part of Toronto centres around Yonge Street, while suburbs have grown up on the slopes rising from the lake. It is a banking and distributing



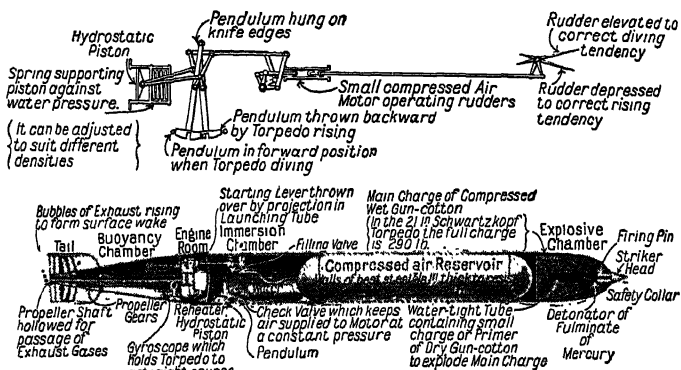
Toronto arms

centre, and has a number of manufactures for which power is obtained from Niagara and the Gattineau river. There is a fine harbour and a good deal of shipping, also a sea-plane base. At Malton is an important airport. Fronting the lake is the National Exhibition Park of 240 acres, the scene of the Canadian national exhibition, held annually since 1879, except for the war years. Centre Island, in the bay, is a pleasure resort.

Toronto was founded in 1794, its first name being York, on the site of a fort erected by the French in 1749. Little more than a small hamlet set in a swamp, it was popularly known as Muddy York. Since 1797 it has been the capital of Ontario. In 1812-14 it was twice taken and damaged by the Americans. In 1834, when the pop. was 10,000, it became a city, but population really began to increase from 1871. In the 30 years between 1881 and 1911 it rose from 96,000 to 376,000; in 1941 it reached 667,000; and the 1950 estimate was 900,000. Toronto is governed by a mayor and a city council.

Toronto, UNIVERSITY OF. Canadian university. It originated in 1827, when a royal charter was granted for King's College to serve as an educational centre for

Upper Canada. In 1842 it began work, and in 1887 it was reorganized as a teaching university, University College providing the education. Victoria, Trinity, and St. Michael's Colleges were added to it. The university buildings are in Queen's Park. It specialises to some extent in the latest developments of engineering and medical research. After the Second Great War the number of students passed 17,000.



Torpedo. Longitudinal section of a Whitehead automobile torpedo; top, diagram showing mechanism for regulating depth of submersion

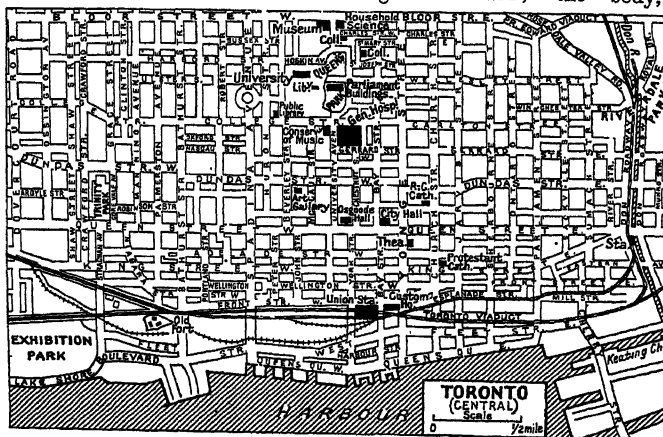
Torpedo OR **ELECTRIC RAY** (Lat. *torpere*, to be numb). Genus of fishes of the family Torpedinidae, nearly related to the skates and rays. See Electric Fish.

Torpedo (Lat. *torpere*, to be numb). A self-propelled cigar-shaped vessel of steel carrying a charge of high explosive, and used as a weapon by warships and naval aircraft. It was devised by Whitehead in 1868, and is in effect a small submarine, in four main sections: the head, which contains the charge and firing mechanism; the body,

which contains a chamber for compressed air or other concentrated source of power, driving the engine; the engine itself; and a compartment containing the gear which controls the torpedo for depth and direction. It is aimed at a target, and travels through the water under its own power. The charge ranges from 500 to 1,000 lb. of high explosive according to the size of the torpedo, exploded by a rod or trigger in

the nose when it strikes the target. It is fitted with a safety appliance to prevent explosion before the torpedo has run some distance, and a flooding device to sink it if it misses its target. Where compressed air is the basis of propulsion, its power can be increased by heating with petrol or oil flame. The engine drives two propellers, which revolve in opposite directions. There is a small steering engine, the steering being controlled by a gyroscope, the movement of which brings the steering engine into operation and corrects any deflection from the predetermined course.

In the British navy there are two standard sizes of torpedo, the 18-in. used by aircraft and small vessels, and the 21-in. carried in larger ships. The efficient range may be as much as 25,000 yds., but increased range necessarily involves some decrease in speed. As compared with a projectile from a gun, a long-range torpedo may be said to travel slowly, taking perhaps four mins. to reach a target 6,500 yds. away, against five secs. by a shell. While the torpedo is approaching the target may alter course, zigzag, or adopt other manoeuvres to avoid the attack. On the other hand, the torpedo strikes below water, where the ship is



Toronto. Plan of the central districts of the capital city of Ontario

weakest, and may explode a magazine. It took about a dozen torpedoes to destroy the Japanese battleships *Musashi* and *Yamato* of 64,000 tons.

A 21-in. torpedo weighs about $1\frac{1}{2}$ tons, its length being 22 ft. During the Second Great War the Japanese used 24-in. torpedoes in their destroyers, with some success. From aircraft, torpedoes are discharged by launching gear, the aircraft coming down almost to the surface before releasing the torpedo.

A torpedo propelled by electricity leaves no visible wake, but it has less range and speed. In the 20th cent. the torpedo had a marked effect on naval tactics, ships being compelled as a general rule to fight at distances outside the range of the torpedo. In the Second Great War the belligerents developed an acoustic torpedo which "homed" on to its target. A diaphragm in the head of the torpedo picked up the vibration of the target's propellers, this operating relays which so set the torpedo's rudder that the missile moved in the direction of the sound. Acoustic torpedoes were generally fired to follow a criss-cross pattern along the estimated track of the target, thereby improving the chances of a hit.

So-called human torpedoes were introduced by the Italian navy early in the Second Great War and were later adopted by all the belligerents. Approx. the same size and shape as an ordinary torpedo, the human torpedo was driven by electric batteries and navigated by a crew of two wearing self-contained diving suits and sitting astride the hull. It was used at night and approached its target submerged so that only the crew's heads were above water. When close to its target, the torpedo dived under the ship, where the crew detached the warhead, fixed it to the bottom of the enemy hull, set a time fuse, and then navigated the body of the craft clear of the target area.

Human torpedoes were first used by the Italians in 1940 against British ships in Alexandria harbour. They were used by the R.N. in Jan., 1943, to attack Axis shipping in Palermo harbour. The German human torpedo consisted of a cylindrical hull with an 18-in. torpedo suspended from either side. The hull accommodated a pilot who navigated the weapon to within striking distance, the torpedoes were released, and the hull returned to base.

Midget submarines, a development of the human torpedo, were introduced in the war by the Japanese, who first used them in the attack on Pearl Harbour. On Sept. 22, 1943, British midget submarines made a successful attack on the German battleship *Tirpitz* (*q.v.*) in Alten Fjord. British midget submarines were 40 ft. long, carried a crew of four, had a range of 50 m., and fired a single torpedo through a tube in the nose.

From 1939 to 1945 British naval losses from torpedo attack from the air, on the surface, and under water, included three battleships, one battle cruiser, six aircraft carriers, and 11 cruisers.

The torpedo is the main weapon of the submarine.

H.M.S. *Vernon*, the R.N.'s principal torpedo school, is a shore instructional and experimental establishment concerned with all under-water weapons.

Francis E. McMurtrie

Torpedo, AERIAL. Torpedo released from aircraft against shipping. In the Second Great War the term was erroneously applied to the parachute bomb (*q.v.*) dropped by aircraft on ground targets.

Torpedo Boat. Originally a small craft of relatively high speed driven by steam engines and designed primarily to attack other ships with torpedoes. Introduced in 1873, it was superseded by the destroyer (*q.v.*) and had become obsolete before the First Great War. Its place is now occupied by the motor torpedo boat (*q.v.*). Hundreds of these vessels served during the Second Great War with British coastal forces. Craft with similar characteristics in the German navy were known as S-boats (*Schnellboote*), erroneously referred to in the U.K. as E-boats (*q.v.*). French motor torpedo boats are termed *redettes torpilleuses à moteurs*; those of Italy were called *motosiluranti* (Ms). In the French and Italian navies destroyers of less than 1,000 tons are classed as sea-going torpedo boats. See *Light Coastal Forces*.

Torpedo Net. Strong steel-meshed net, formerly carried out from the side of a warship by booms as a protection against torpedo attack. This method of defence was finally discarded by warships during the First Great War as cumbersome and ineffective, but was revived in improved form during the Second Great War for merchant ships in convoy. Net of a similar kind are still in

use as part of the boom (*q.v.*) defences of bases and harbours.

Torpex. Powerful explosive consisting of a mixture of RDX, TNT, and aluminium powder. Developed during the Second Great War as a filling for mines and torpedoes, it was the most effective under-water explosive used.

Torphichen. Village and parish of W. Lothian, Scotland. It is 3 m. S.S.W. of Linlithgow, and grew round a hospital or preceptory of the Knights of S. John of Jerusalem, of which there are still some ruins. The parish church is built on the site of the nave of the preceptory church. The principal industries are coal mining and brick-making. Here was born Henry Bell, designer of the steamboat *Comet*.

Torpid. Bumping races on the river for crews representing colleges of Oxford university. Unlike the Summer Eights, but like the Lent Races at Cambridge, they are not open to oarsmen of certain attainments. Traditionally they begin on a Thursday in Feb. and extend over six afternoons.

Torquatus, TITUS MANLIUS IMPERIOSUS (4th century B.C.). Hero of ancient Rome. His name *Torquatus* was derived from the torc which he took from the neck of a gigantic Gaul whom he defeated in single combat in 361. His victory, won with his colleague P. Decius Mus, over the Latins at Mt. Vesuvius in 340 finally settled the question of Roman or Latin supremacy. In this campaign a son of *Torquatus*, disobeying the orders of the consuls against single combats, met and vanquished a Latin noble. He bore the spoils to his father, but the stern old Roman had him put to death for disobedience. *Torquatus* was twice dictator and thrice consul.

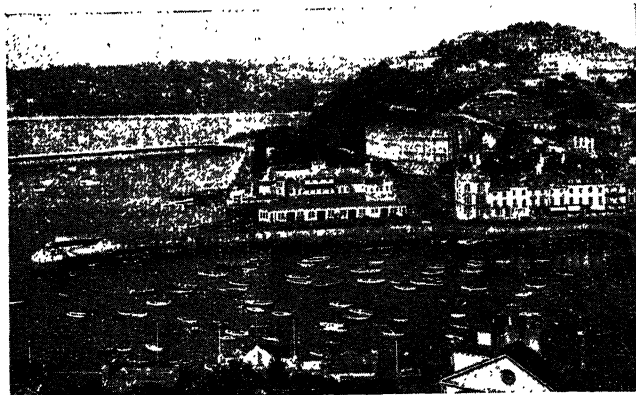
Torquay. Mun. bor., seaport, and watering-place of Devon, England. On the S. coast, it stands on hills above Tor Bay and is 26 m. due S. of Exeter, having connexion with that city by rail and bus. Its mild climate attracts visitors throughout the year. For them there are theatres,



Torquay arms

gardens with sub-tropical plants, and other attractions, as well as facilities for yachting, golfing, and bathing; there are excursions to Brixham, Cockington, Dartmoor and Totnes, and trips in Tor Bay.

The modern buildings include the town hall, museum, and several



Torquay, Devon. View looking westward across the harbour with Waldon Hill on the right

churches, of which S. John's is the most notable, while there are several hospitals. The town has some interesting remains, among them the ruins of Tor Abbey and S. Michael's chapel, an Early English building. In Kent's Cavern (*q.v.*) have been found remains of prehistoric man. The old church at S. Mary Church, now a suburb, was almost destroyed by bombing in the Second Great War; another is at Tor Mohun. There is a trade in coal and stone, and marble and terra-cotta are worked, but the chief occupation is catering for visitors.

Known at first as Tor or Torre—the latter name now applies to a suburb, with remains of a Premonstratensian abbey—Torquay grew in the 19th century from a small fishing village to a considerable town. It was made a bor. in 1892 and gives its name to a bor. constituency. The council maintains medicinal and swimming baths. Pop. 59,000. See Paignton.

Torque. In engineering, a force applied in such a way as to tend to cause rotation. It is measured by the moment of the force applied to a body subject to torsion.

In electrical engineering, torque is the force exerted at the periphery of an armature or rotor of an electric motor when it is energised. Torque is measured in foot-lb. and a torque of 100 foot-lb. is produced when at the periphery of an armature or a rotor with a radius of one foot a force of 100 lb. is exerted. D.C. and three-phase A.C. motors are said to have a uniform torque; that of a single-phase A.C. motor is less uniform. The starting torque is the force exerted by the armature or rotor to overcome inertia, etc.

In aeronautics, torque denotes the tendency of an aeroplane to

rotate round the airscrew shaft caused by the resistance of the air to the rotation of the airscrew. See Torc.

Torquemada, JUAN DE (1388–1468). Spanish theologian and cardinal. Born at Valladolid, he studied in Paris, and joined the Dominican order, of which he became prior. His *Meditationes*, first printed in Rome in 1467, were several times reprinted. He upheld the authority of the pope, and at the council of Constance he proposed the dogma of the Immaculate Conception. Made a cardinal in 1439, he died Sept. 24, 1468.

Torquemada, TOMAS DE (1420–98). Spanish inquisitor. The son of the lord of Torquemada, he was born at Valladolid, where he entered the Dominican order as a boy. He refused preferment time and again, but was made prior of the monastery at Segovia, where he remained for 22 years. The fame of his learning and humility soon spread abroad, and Torquemada was appointed confessor to the Infanta Isabella, over whom he soon established complete domination. When Isabella became queen, 1474, Torquemada retained his position and became confessor also to her husband, Ferdinand. His obsession growing against heretics, Moors, and Jews, in 1478 he persuaded Ferdinand and Isabella to revive the Inquisition in Spain, where it had largely fallen into disuse. The institution was approved by a papal bull, and Torquemada, setting up his first tribunal in Seville, 1481, was two years later appointed sole inquisitor-general over all Spanish dominions.

Thenceforth for 13 years Spain suffered a reign of terror. Almost immediately protests were made both to the sovereigns and to the

pope. The former were pleased, however, with the vast stream of wealth deriving from fines and confiscations, while the latter was at first ambitious to acquire some proportion of the booty. Torquemada during his persecutions probably condemned over 2,000 persons to death by burning. By 1496 the extermination of unbelievers had become an obsession, but his actions in disposing of the wealth brought in led to reprimands from both court and pope. Meanwhile Torquemada had been attacking Moors and Jews on a larger scale. By urging the sovereigns to prosecute the war against the Moors with the greatest severity, he was responsible for their final defeat and the capture of Granada, 1492; the same year he persuaded the sovereigns to promulgate decrees banishing from Spain every Jew who did not embrace Christianity within four months, and forbidding Christians to have dealings with unconverted Jews. According to Prescott, over 160,000 Jews quitted Spain, and the country fell into commercial ruin from which it never recovered. Torquemada continued his persecution until his death, Sept. 16, 1498, at Avila, where he was buried. In his last years he had gone always in fear of his life, and had always been escorted by a bodyguard of some 150 men.

Torquemada's persecutions are the greatest blot upon the history of Spain and of the R.C. Church. But the pope and the Spanish sovereigns must bear their share of responsibility. Attempts have been made to present his character in a saintly light and to convict him of no more than mistaken zeal; they fail because Torquemada was notoriously despotic and cruel and delighted in his office. His name has become the symbol for diabolical cruelty. Consult T. et l'Inquisition, De Molènes, 1897; Torquemada, H. G. de Saint-Amand, 1910; T. and the Spanish Inquisition, R. Sabatini, 1913.

Torre Annunziata. Town of Italy, in the prov. of Naples. It stands at the S. base of Mt. Vesuvius, on the Gulf of Naples, and is a rly. junction 13 m. S.E. of Naples. It has a harbour, with a fishery and coasting trade, a state arms factory, ironworks, and manufactures of macaroni and paper. The town has often suffered from the eruptions of the volcano. Pop. approx. 25,000.

Torre del Greco. Seaport of Italy, in the prov. of Naples. It stands on the Gulf of Naples, 8 m.

by rly. S.E. of Naples. Situated at the S.W. foot of Mt. Vesuvius, it is built chiefly of lava on the solidified flow of 1631, when the larger portion of the old town was destroyed. Lava streams did much damage in 1737, 1794, and 1861, as also did the earthquake of 1857. There are shipbuilding yards, lava quarries, coral-polishing works, and fisheries of tunny, sardines, and oysters. The rich volcanic soil of the district yields much fruit. Pop. approx. 35,000.

Torrens. Inland lake of S. Australia. It occupies the N. portion of the Great Valley of South Australia and is 90 m. N. of Spencer Gulf, 130 m. long and 20 broad, and 80 ft. above sea level. It was discovered by Eyre in 1840. It is but a mud flat covered with a few ins. of water after heavy rain.

Torrens, SIR ROBERT RICHARD (1814-84). Australian statesman. Born at Cork and educated at



Sir Robert Torrens,
Australian
statesman

Trinity College, Dublin, he emigrated to South Australia in 1840. Collector of customs next year and colonial treasurer in 1852, he was elected to the first parliament three years later and became

prime minister in 1857. He then introduced the Torrens Act, which provided for the conveyance of property by registration instead of by the cumbersome methods then in vogue, and spent the next few years travelling through Australia to explain its working. On retiring in 1863, Torrens returned to England and was M.P. for Cambridge, being knighted in 1872. He died at Falmouth, Aug. 31, 1884.

Torreón. City of Mexico. It is in the state of Durango, and is 220 m. W. of Monterey. It is a rly. junction, the seat of important smelters and cotton and flour mills, and the centre of the district producing most of the cotton raised in Mexico. Torreón is connected by road with Monterey and Chihuahua and thence with Mexico City. Here in 1914 the forces of Villa defeated those of Carranza's government. In the neighbourhood are gold, silver, and copper mines. Pop. 87,765.

Torre Pellice (Fr. La Tour). Town and summer resort of Italy, in the prov. of Turin. It stands at the foot of the Cottian Alps, in one of the Vaudois valleys, 10 m. by rly. S.W. of Pinerolo and 34 m.

S.W. of Turin. It manufactures cotton, cloth, and silk. There are a church and college here of the Waldenses, who made the town their headquarters for centuries.

Torres Strait. Sea passage between Cape York Peninsula, Queensland, and Papua, New Guinea. It is about 90 m. in width, and contains numerous islands ranging from patches of sand or coral, some as much as 50 sq. m. in area. The larger islands, chief of which is Thursday Island (*q.v.*), are inhabited; some of the islets are used by the natives as fishing stations or gardens. About 1890 the strait became celebrated as a pearling ground; the natives were badly treated by pearl-hunters. The Queensland government intervened, and established a staff of protectors who, with the assistance of missionaries, checked the abuses and improved the condition of the natives. In addition to pearls and pearl shell the Strait yields *bêche de mer* (*q.v.*) in large quantities. Navigation through the tidal rips and among the coral reefs is difficult and dangerous, natives being the best pilots. The Strait was discovered by Torres in 1606.

Torres Vedras. Town of Portugal. It is situated on the river Sizandro, 24 m. N.W. of Lisbon, is the centre of a vine-growing dist., and has hot sulphur baths and a Moorish castle. Many Latin inscriptions point to its Roman occupation, but the name *Turres Veteres*, or old towers, is medieval. It was captured from the Moors in 1149, and soon became important, the Cortes meeting here in 1441.

It was from here that Wellington's famous lines stretched to the Tagus. The threefold lines consisted of 114 forts strongly built and enclosed, and linked together by entrenchments and inundations, converting 500 sq. m. of mountainous country, lying between the Tagus and the sea, into a gigantic entrenched camp. After the campaign of 1810 Wellington, closely pursued by Masséna, withdrew behind the tremendous barrier formed by the first of these lines, and the French were brought to a complete standstill. During the winter of 1810 Masséna held on before the lines with great tenacity, but in March, 1811, he fell back before Wellington, who pursued him until on May 5 he was able to turn him out of Fuentes d'Onoro. Here there was an engagement in the civil war of 1846. Pop. 8,700.

Torrey, JOHN (1796-1873). An American botanist. Born in New York, Aug. 15, 1796, he early came

under the influence of Amos Eaton, a natural history pioneer in America. In 1836 he was appointed botanist to New York state; from 1838 he was issuing the earlier part of his *Flora of North America*, and in 1843 his *Flora of New York State*. Torrey's name is commemorated in the coniferous genus *Torreyia*. He died March 10, 1873.

Torrey, REUBEN ARCHER (1856-1928). American preacher. Born at Hoboken, Jan. 28, 1856, he was educated at Yale, and in 1878 became a Congregational minister. After some years in Minneapolis, he went in 1889 to Chicago, where until 1908 he was superintendent of the Moody Bible Institute. Torrey assisted Moody in his evangelistic work, and became known as a revivalist. During 1902-03 he toured round the world, and 1903-05, with C. M. Alexander, conducted mission services throughout Great Britain. In 1912 he was made dean of the Bible Institute at Los Angeles. He died Oct. 27, 1928.

Torricelli, EVANGELISTA (1608-47). Italian scientist. Born Oct. 15, 1608, he studied mathematics in Rome, and there became fascinated by the work of Galileo, whom he aided in the preparation of his *Discorsi*. Torricelli succeeded Galileo, on the latter's death in 1642, in the chair of philosophy and mathematics at Florence. His experiments on atmospheric pressure led to his balancing the weight of a column of mercury against the pressure of the atmosphere, and so discovering the principle of the barometer. The space above the mercury in a barometer is still called the Torricellian vacuum. He died Oct. 25, 1647.

Torridge. River of England, in Devon. It rises 4 m. S.E. of Hartland Point and flows S.E., E., and N.W. to join the Taw estuary in Bideford Bay. See Bideford.

Torridon, LOCH. Fjord inlet on the W. coast of Scotland, in the co. of Ross and Cromarty. Torridon village is at the head of the loch, and near it is Torridon deer forest with an area of 18 sq. m.

Torridonian Sandstone. Group of sedimentary rocks found in N.W. Scotland, Iona, and Islay. Coarse feldspathic sandstone or arkose is the dominant member, but breccias, conglomerates, and shales also occur. The Torridonian lies unconformably on the Lewisian gneiss, and is itself overlain by unconformable lower Cambrian. It is therefore of pre-Cambrian age. It contains wind-polished pebbles, and was probably deposited under cold desert conditions.

Named after Loch Torridon, it forms many of the high mountains around that loch, as well as Suilven, Canisp, Stack Polly, etc. See Pre-Cambrian.

Torrid Zone. Climatic zone surrounding the earth and extending from the tropic of Cancer to the tropic of Capricorn, i.e. over 47° of lat. Except when the sun is at the two tropics, it is overhead at noon twice a year; at other times its midday elevation is never less than 43° . The diurnal variations of temp. in this zone are therefore more pronounced than the seasonal, although there is a tendency over the year for a double maximum and double minimum, especially at the equator. There is a distinct wet and dry transition in the rainfall distribution. According to this astronomical sub-division of the earth, the zones between $66\frac{1}{2}^\circ$ (i.e. Arctic and Antarctic Circles) and $23\frac{1}{2}^\circ$ are designated the temperate zones, and those polewards of the polar circles, the polar zones. The basis for this zonal treatment of climates is the dependency of temp. upon incoming solar radiation, and hence in turn upon lat. Considerable modification of this elementary classification is necessary in practice. See Climate; Tropic; Zone.

Torrigiano OR TORREGIANO, PIETRO (1470–1522). Florentine sculptor. He studied at Florence, where, after an affray with Michelangelo his fellow-student, he was obliged to leave the city. He went to Rome, where he was employed by Pope Alexander VI, and served as a soldier under Caesar Borgia: he found his way to England about 1508, and executed the tomb of Henry VII in Westminster Abbey, and other works. He died in Spain, having been imprisoned by the Inquisition.



Pietro Torrigiano,
Florentine sculptor

Torrington. Mun. bor. and market town of Devon, England. Standing on a hill above the Torridge, 7 m. S.S.E. of Bideford. It has a rly. station. The parish church of S. Michael was blown up by the explosion of 80 barrels of gunpowder in 1646, rebuilt in 1651, and restored in 1884. One of its



Torrington
arms



Torrington, Devon. Parish church
of S. Michael

earlier incumbents was John Howe (q.v.), the Puritan divine. There is a bluecoat school, founded in 1671. The ruins of the castle, built in 1340, were demolished in the 18th century, and near the spot now stands a Waterloo column, erected in 1816. Glove making and agriculture are the principal industries, and there is a milk-canning factory. Near is the battlefield where Fairfax routed the royalists in 1646. Market day, Sat. Pop. 2,913.

Torrington. Bor. in Litchfield co., Conn., U.S.A. On the Naugatuck river, it is 36 m. W. of Hartford by the New York, New Haven, and Hartford rly. A brass industry was founded here in 1834, the centenary of the first settlement, and in 1851 one of the earliest condensed milk factories was opened. Engines, hardware, needles, and woollens are also produced. The town, incorporated since 1887, has a pop. of 26,988.

Torrington. GEORGE BYNG, VISCOUNT (1663–1733). English sailor. Born Jan. 27, 1663, he entered the navy in 1678 and saw considerable service before he sailed in 1684 to the E. Indies, where he took part in several actions against pirates. In



Viscount Torrington,
English sailor

1688, as an agent of the prince of Orange, he won many of the senior captains of the fleet to the prince's cause. As rear-admiral he commanded the naval operations at the capture of

Gibraltar and took part in the battle of Malaga, 1704. In 1708 he dispersed the Old Pretender's attempted invasion of England. Byng was sent to the Mediterranean to prevent a Spanish invasion of Italy, and totally destroyed the Spanish fleet off Cape Passaro, July 30, 1718. Returning to England in 1720, he was created Viscount Torrington, became first lord of the Admiralty in 1727, and died Jan. 17, 1733.

Earlier there had been an earl of Torrington, Arthur Herbert (1647–1716), also a sailor. He took the invitation of the English peers to William of Orange in 1688, and in 1690 was in command of the English and Dutch fleet beaten by the French off Beachy Head (q.v.). He died April 14, 1716.

Torry Research Station. Division of the department of scientific and industrial research. Workers at this station at Aberdeen are concerned with the migration and breeding of edible fish. Members of the staff accompany the fishing fleets to carry out investigations in the subject.

Torsion. In mechanics, the condition produced in a solid body when parallel planes are turned relatively to one another about an axis perpendicular to them both. As long as the material is not stressed beyond its elastic limit by the twisting torque, then the angle of twist displacement, or strain, between two planes of measurement is proportionate to the twisting moment and stress (see Strain and Stress). If the distance between the planes of measurement is increased, then the angle of twist increases proportionately. Owing to stress distribution of equal torques over successively smaller areas of cross-section, a thin wire or rod twists proportionately more than its smaller size seems to justify. Thus, if pieces of wire of constant length and identical material are twisted about their axes by equal torques, and the torsional elastic limit is not exceeded, then the angle of twist will vary inversely as the fourth power of the diams. of the wires, i.e. if the diam. is halved, the angle of twist is multiplied by 16. The magnitudes of very small torques, such as those produced in a measuring instrument like a galvanometer, are measured by applying the torques to the end of a very thin wire and measuring the angle of twist.

Torsional properties of various materials are measured by standardised torsional tests to deter-

mine their suitability for mechanical applications in which a torque has to be transmitted from one part to another. The commonest example of use of torsional properties is a helical spring. Glass, rubber, steel, and quartz all have good torsional elastic properties.

Torso (Ital.). In sculpture, term for the trunk of a statue of a human figure as distinct from



Torso of the Apollo Belvedere in the Vatican, Rome

head and limbs. It is applied to certain pieces of antique sculpture of which head or limbs are now missing, e.g. the so-called Belvedere torso, in the Vatican; but many later sculptors, notably Rodin, have set themselves to express their powers and their appreciation of the human framework in the modelling or carving of figures from which head and limbs are deliberately omitted, and such a figure is also known as a torso.

Torstenson, LENNART (1603-51). Swedish soldier. Born at Torstena, Aug. 17, 1603, he served under Gustavus Adolphus against the Danes and in Germany, where he had charge of the artillery. After his master's death in 1632 he was one of the Swedish leaders during the Thirty Years War, and in 1641 was made commander-in-chief. His fame rests chiefly on his stupendous victory over the Imperialists at Breitenfeld, Oct. 23, 1642, but he also crushed the Danes in 1643, and at Jüterbog in 1644 inflicted another defeat upon the Imperialists, while in 1645 his army seriously threatened Vienna. Soon after this Torstenson resigned his command, owing to ill-health, was created a count, and in 1648 was appointed governor of W. Sweden. He died April 7, 1651.

Tort (Fr. *tort*, wrong). Term in English law to express a wrongful act, other than a breach of contract or a crime, for which an action for damages will lie at the suit of the person wronged.

Torts may be classified in many ways, but the most convenient, if not the most scientific, is to divide them into (1) wrongful acts which in themselves give rise to an action; (2) wrongful acts which are only actionable if actual pecuniary loss and damage are proved. In (1) damages are not, and in (2) damages are, of the essence of the cause of action.

Not every act, however, that causes damage is necessarily a tort. For example, where A had a water-mill, and his mill stream was fed by percolations running underground from the land of X; and X dug himself a well on his own land so deep as to attract all the percolations, whereby A's mill stream ran dry, A had no cause of action against X. X was merely doing what he had a right to do, viz. to dig a well in his own land, and the fact that his act was damaging to A did not make it any the less lawful.

The principal headings of tort are: (1) Trespass to the property or person. In this case no pecuniary damage need be proved. A man has an absolute right that

Slander of title; (11) Deceit or fraud; and (12) Waste. In a few cases the damages in actions of tort are not confined to the actual loss suffered; but the court or jury may award what are called punitive or exemplary damages.

In the case of a continuing tort, the court may grant an injunction to restrain the continuance thereof, in addition to or in substitution for damages. A threatened tort may sometimes be restrained by injunction. An infant is liable for his torts, though not on his contracts. The law of torts is virtually the same in the U.S.A. and the countries of the British Commonwealth as it is in England, while Scotland has a law very similar.

Torticollis (Lat. *torquere*, to twist; *collum*, neck). Disorder of the neck. See Stiff Neck.

Tortoise. Name given generally to all the land species of the order Testudinata of the reptiles; the aquatic species being known as terrapins and turtles. They are characterised by the fact that the skeleton is partly external and forms a bony box or shell for the animal's protection. None of the tortoises has teeth; but the jaws are cased with horn to form a cutting beak. In most of the land species, the carapace is covered with horny plates, often finely mottled; superior kinds are used for



Tortoise. 1. Species in the London Zoological Gardens, the giant being *Testudo elephantina*, from the Seychelles. 2. Common European tortoise

nobody (except by authority of law) shall touch him or his property. (2) All defamatory libels, and some slanders, are also actionable without proof of damage. (3) Detention or conversion (see Trover) of another's property is also actionable *per se*; and so are (4) False Imprisonment and (5) Malicious Prosecution. (6) Negligence is a tort only where actual damage to the plaintiff is proved; and the same observation applies to (7) Nuisance; (8) Conspiracy; (9) Certain kinds of slander; (10)

tortoiseshell, but the best tortoiseshell is from a species of turtle.

Tortoises are confined to the warmer regions of the world, some six species occurring in S. Europe. They feed mainly on plants, and most of them are about during the day. In the cooler districts they hibernate in the ground during the winter, but in the hotter districts they may be found all the year round. They are renowned for their longevity, especially the giant tortoises. These are now confined to the Galapagos Islands in the S.

Pacific, and to certain islands in the Indian Ocean. They are sometimes between four and five feet long. One example is known to have lived for 127 years, and another lived in captivity for 140 years.

The tortoises of S. Europe (*Testudo graeca*) are from 6 to 10 ins. long, and have the carapace mottled with yellow and black. They are used for food in Italy and Sicily. The females lay about twelve round white eggs, which they bury in sunny spots about the month of June. *Testudo loveridgii*, which was discovered in German E. Africa during the First Great War, is a flattened, soft-shelled tortoise that can inflate itself, and so fix itself in its position as to escape capture. See Animal colour plate; Turtle.

Tortoiseshell. Horny material or scales covering the carapace of the hawksbill turtle. The reptile is one of the marine turtles of the tropics, *Chelone imbricata*, and the tortoiseshell it provides is semi-transparent and mottled in appearance. Up to 8 lb. of shell may be obtained from one turtle, the scales being heated in oil or water and moulded together under pressure. In the 20th century the material has been largely superseded by synthetic plastics. See Turtle.

Tortoiseshell Butterfly. Popular name for two species of butterfly, natives of Europe (including Great Britain) and Asia. The Large Tortoiseshell (*Nymphalis polychloros*) is $2\frac{1}{2}$ ins. across the scalloped wings, which are dull orange-brown, blotched, spotted, and margined with black; on the hind wing five blue crescents unite with the black border. The Small Tortoiseshell (*Aglais urticae*), which is usually less than 2 ins. across the wings, is a much more plentiful and a brighter insect, and the blue crescents margin all the wings. The caterpillars feed upon stinging nettles, and until nearly full-grown an entire brood will feed in company. See Butterfly colour plate.

Tortona (anc. Dertona). Town of Italy. In the prov. of Alessandria, it stands on the river Scrivia, at the base of an eminence crowned by a ruined medieval fortress, 13 m. by rly. E. of Alessandria. Its cathedral dates from 1584, Santa Maria dei Canali from the 9th century. Other prominent buildings are the episcopal palace and the museum. The fortifications, destroyed by the French, are replaced by avenues. Industries are silk-weaving, hat-making, and tanning. Pop. 20,000.

Tortosa (anc. Dertosa). City of Spain. In the prov. of Tarragona, it is built in terraces on an eminence

above the river Ebro, 22 m. from its mouth and 40 m. by rly. S.W. of Tarragona. Encompassed by old and crumbling walls, its dominating feature is the cathedral founded in 1158, rebuilt in the middle of the 14th century, and restored later. From its small harbour it exports wine, oil, corn, fruits, and liquorice, and it has manufactures of majolica, articles made from palm leaves and grass, silk, spirits, etc. A *colonia* under the Romans, it was, as the key of the Ebro, long an object of contention between Moors and Christians. The French captured it in 1811 and held it until 1814. Pop. 35,000.

Torture (Lat. *tortura*). The infliction of severe bodily pain to force persons to confess, give some required information, do or say something contrary to their ordinary beliefs, or as a punishment.

In early times torture was the recognized punishment meted out by the conqueror to his captives. In Greece and Rome slaves were tortured almost as a matter of course to obtain from them evidence in trials. In the 13th century torture of heretics received ecclesiastical sanction by the decree of Pope Innocent IV, and torturing increased until it culminated in the horrors countenanced by the Inquisition. In Europe during the 14th cent. and in England in the 15th torture was widely practised judicially. Part of the common law of most European countries, it was never recognized by English common law. State prisoners in the Tower were often put to the torture, but in 1628 the English judges laid it down that torture as such was illegal. Torture methods in state trials existed till the 17th century in England, and later in France and Germany. See Boot; Cage; Cang; Inquisition; Rack; Thumbscrew.

During the Second Great War, in areas under their occupation, the Germans and Japanese initiated systems of torture, often scientifically devised, which were imitated later in dictatorship countries throughout the world. See Concentration Camp; Gestapo.

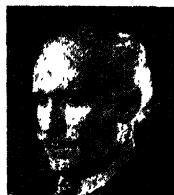
Torun (Ger. Thorn). Town in Poland. It stands on the right bank of the Vistula, 90 m. S. of Danzig. Founded in the 13th century by the knights of the Teutonic order, it was an old fortress town. Annexed to Poland in 1454, at the partition of 1793 it reverted to Prussia. Napoleon added it to his new grand duchy of Warsaw, but Prussia recovered it after the congress of Vienna in 1815. By

the treaty of Versailles it was given to Poland. The town was an important member of the Hanseatic league. The town hall, a leaning tower, an ancient castle, and the churches of S. John, S. Mary, and S. James were among its interesting buildings. In the market place stood a colossal bronze statue of Copernicus (1473-1543), who was born here. In the part of Poland occupied by Germany in 1939, it was carried by assault Feb. 1, 1945, by Rokossovsky's 2nd White Russian army after being surrounded and by-passed earlier; the German garrison was wiped out in violent street fighting. Pop. 60,000.

Tory. Name given in Great Britain to a political party. Although the word was used in the time of the Commonwealth, its present use dates from about 1678. The supporters of Charles I and II in Ireland were known as Tories, from an Irish word meaning "come, O king," and, during the debates on the Exclusion Bill, someone applied the term contemptuously to those who opposed that measure. Like Whig, it soon became the designation of a party in the state, and remained so until the middle of the 19th century. Under the influence of Peel and Disraeli, the Tory party became the Conservative and then the Unionist party, though the word Tory continued in popular use. See Conservative; Unionist; United Kingdom; Whig.

Tosca, LA. Five-act play by Victorien Sardou (q.v.). Its scene is laid in Rome in 1800, Tosca being a singer loved by the governor Scarpia. First produced at the Théâtre Porte-St. Martin, 1887, it was played by Sarah Bernhardt in London in 1892, 1897, and 1907, and an English version was given in London, 1889. An opera by Puccini is founded on the play, and was first produced in Rome and London in 1900.

Toscanini, ARTURO (b. 1867). Italian conductor. Son of a tailor, he was born at Parma, March 25, 1867, and studied the 'cello at the conservatoire there. He



Arturo Toscanini,
Italian conductor

toured Italy and S. America as an orchestral player, and began to conduct in Rio de Janeiro, 1886. After organizing and conducting the Turin orchestra, 1893, he became famous for his memory, his

emotional and intellectual grasp of music, and personal magnetism. Conductor at La Scala, Milan, 1898-1908 and 1921-29, he was at the Metropolitan Opera House, New York, 1908-15.

A firm democrat, Toscanini refused to conduct the Italian fascist anthem in 1922, and in 1931 he was assaulted by a fascist mob. He conducted at Baireuth, 1930-31, and at Salzburg, 1934-35, but did not appear in Germany after the rise of Hitler. Later he lived chiefly in the U.S.A. where he directed the N.B.C. symphony orchestra from 1937. He returned to La Scala in 1946. He had always done much to introduce the work of composers previously unknown to Italy. He refused to allow encores, and exacted strict obedience from singers and players. *Consult Life, P. Stefan, 1936.*

Tosti, SIR FRANCESCO PAOLO (1846-1916). Italo-British composer. Born at Ortona, April 9,

1846, he studied music at Naples, and taught there until 1869. Encouraged in his early composition by Sgambati, he secured a court appointment in Rome, and in 1875 paid his first visit to England. In



Sir Paolo Tosti,
Italo-British composer

By courtesy of
Ricordi & Co.

1880 Tosti became singing teacher to the royal family, and settled in London. He became a naturalised British subject, and was knighted in 1908. He composed numerous sentimental songs which enjoyed great popularity, especially Good-Bye, Ask Me No More, Mother, Vorrei Morire, Parted, and For Ever. He died Dec. 2, 1916.

Tossing the Caber. See Caber.

Tostig (d. 1066). Anglo-Saxon noble. A younger son of Earl Godwin, he was made earl of Northumbria in 1055. His unpopularity, largely due to severity, led to a revolt in 1065, and the earl was declared an outlaw, his brother Harold concurring in this sentence. For some months he lived abroad, taking part in raids on the W. of England. He joined Harold Hardrada, king of Norway, in his invasion of England, and was killed with him at Stamford Bridge, Sept. 25, 1066.

Totalisator. Machine for registering bets on racecourses and greyhound tracks. Invented in Great Britain, it was first installed

for public use at Newmarket in 1930. Basically its principle of design and operation is adapted from the automatic telephone exchange (see Telephony). The all-electric totalisator has two main sections: the ticket-issuing machine; and the indicator, which shows the individual bets on each runner and the total bets on the race. Ticket-issuing machines may be in the main totalisator building or at convenient positions on the course. There is a machine to correspond with each runner on the card, and insertion of the appropriate coin actuates mechanism which automatically prints on a card the runner's name and the time of the race. Tickets are handed in to clerks who register the bets on a keyboard. The bets are then automatically totalled. Each single transaction is recorded on electrical indicators all the time betting is in progress. Immediately the race starts, the recorders are switched off, automatically locking the issuing machines.

At the end of the race the winner's odds are calculated according to the total amount of money laid, and payment is made to backers on production of their betting cards. A "tote" deals with bets from 100 to 400 issuing machines; accepts bets, win or place, on any number of runners up to 80; and gives out tickets at 50 a min. Machines and indicators can be located at any distance up to approx. 2 m. from the main building, with which they are in electrical communication. It takes less than a min. to announce dividends after the race. For the legal aspect, see under Betting, p. 1127.

Totalitarianism. Term coined in the 20th cent. for the theory of govt. which postulates one political party only in a state, and that the governing party. In this conception party and state are one; and the state is entitled to require any service or sacrifice from any person and to deny all private rights if those at the head of the state consider this necessary to advance or safeguard the state. The fundamental idea of this theory is that man exists to serve the state, not the state to serve man. Examples of totalitarian states include fascist Italy, nazi Germany, falangist Spain, and communist Russia. The term is sometimes by extension also applied to a despotism such as that of Shinto Japan. See Anarchism; Fascism; Hitler; Individualism; Mussolini; Nazism.

Totana. Town of Spain, in the prov. of Murcia. It stands among

the S. spurs of the Sierra de Espuña, 27 m. by rly. S.W. of Murcia. It has an aqueduct 7 m. long. There is trade in olives and wine. The pop., 16,100, includes many gypsies.

Totemism. Term used in anthropology in two senses, viz.: (1) A specific magical relation between a group of people, called a totem kin, or sept, and a species of animals, plants, or other objects, individual members of which are called by Europeans totems. (2) A form of social organization in which a tribe is divided into exogamous kins or clans, each related to its own totem species, and believed to consist of blood relatives descended from a single ancestor.

A totem kin and its totem are supposed to aid each other, and a similar relation subsists between the members of a group of people not based on an hereditary principle, e.g. religious or magical societies, or embracing the whole of a tribe, as in S. Africa, and not only a section of it, as in the normal totemic community. But the social side of the organization is not necessarily associated with the magico-religious relation of the human and animal groups. We therefore find "individual totems" (manitu of the Red Indian, tribal), "phratric" and "class" totems



Totemism in Australia. Totem magician dressed to represent a bullock in blossom, working magic to force food bulbs to flower

From *Across Australia*, Spencer and Gillen
by courtesy of Macmillan & Co., Ltd.

(Australia), sex totems (Victoria) respected by males or by females only. A singular class are the "linked totems" of Australia, New Guinea, and Melanesia; in place of one totem species each kin has two, three, or more. Conversely, in W. Africa there are totem kins with different totems linked in very close relationship.

Totemism, in the strict sense, is found in Australia, Africa, America, Oceania, and parts of Asia; it has been attributed to the ancient Semites and to people speaking Aryan languages, but the evidence is not universally accepted.

The distinctive features of totemism differ so markedly that no universal features can be enumerated; e.g. some tribes eat their totems ritually, like the Arunta and Edo. The following are some features of totemism; (1) the totem must not be touched, killed, eaten, kept in captivity, or even looked at; (2) the kin claims that its ancestors were transformed totem animals, that its members are reincarnated totem animals, or that the totem has a claim on its gratitude; (3) carvings of totemic animals are set up, or their forms are tattooed on the body of the kinsman; (4) the totem is called a brother; (5) dead members of the animal species are solemnly buried; (6) captive members are bought and freed.

The origin of totemism has been attributed to certain primitive beliefs, such as that (1) the souls of the dead inhabit the totem species; (2) living men's souls are in the totem; (3) conception is due to the spirit part of an animal entering the woman's body; it has also been suggested that the individual totem developed into the kin totem, when a man's children began to respect his sacred animal. Probably some or all of these causes have contributed to building up the complex system; but the difference between the totemism of different areas makes a unitary origin improbable. Magical societies with totem protectors may have been formed on the analogy of the relationship between individual men and animals, but these supposed tutelars are not known to have existed universally; again, the magical cooperative society of Central Australia does not seem to be a stage in the life of a normal totemic tribe.

In some lands, e.g. Samoa, totemism has developed into the worship of certain animals, and in others, e.g. S. Africa, into a form of ancestor worship. Not all animals found associated with gods are or have been



Totnes, Devon. East Gate dividing Fore Street from High Street

totems, nor are the animal forms of a god due to his original totemic character, for animal worship is widely spread, and many species are respected because they are dangerous or useful. There is no reason to suppose that totemism played a large part in the domestication of animals.

Bibliography. Totemism, J. G. Frazer, 1887; Primitive Culture, E. G. Tylor, 1903; The Secret of the Totem, A. Lang, 1905; Marriage, Totemism, and Religion, Lord Avebury, 1911; Totem and Taboo, S. Freud, new ed. 1919.

Tothill Fields. Formerly an open space of Westminster, part of which extended S. from Victoria Street towards the Thames. Its name, variously spelt Tuthill and Tuttle, derives from a mound or hill of outlook near Regency Street, and survives in Tothill Street. Royal solemnities, and jousts, fairs, markets, and duels took place here, and the fields, famous for parsley, served as a playground for the boys of Westminster School, the present playing field of which, in Vincent Square, was in 1793 the site of a bear garden.

Totila (d. 552). King of the Ostrogoths. In 541 he became king and entered at once upon a war with the E. Roman empire, his aim being the recovery of Italy. He took Naples among other exploits, and in 546, after a long siege, he captured Rome. He again took the city, which had been recovered by Belisarius, in 549, after which he conquered Sicily, Sardinia, and Corsica. Once more in Italy, he was defeated by Narses at the battle of Tagina, July, 552, being killed as he tried to escape. Totila's real name, according to his coins, was Baduila.

Totnes. Mun. bor. and market town of Devon, England. Situated on the W. bank of the Dart, 9 m. W.S.W. of Torquay, it is an old town, first chartered in 1206.

Many of the houses overhang to form covered footways. The parish church of S. Mary, built in the 15th century and restored 1886-89, contains a fine rood screen, and carved corporation stalls (1636). Near is the old guildhall. At the upper end of the town are a ruined Norman castle and the old North gate. The grammar school was founded in 1554. Market day, Fri. Pop. 5,750. About 1 m. distant is Dartington Hall (q.v.).

Totonac. American Indian tribe, mostly in Vera Cruz and Puebla, Mexico. Numbering some 64,000, they descend from a pre-Columbian people who were independent for 650 years until reduced to an Aztec tributary state.

Totonicapan. Town of Guatemala. The capital of a dept. with the same name, it is situated 55 m. W.N.W. of the ruined city of Guatemala. Manufactures include textiles, woodwork, and pottery. Pop. 30,103.

Tottenham. Bor. of Middlesex, England. Bounded N. by Edmonton, S. by Stoke Newington and Hackney, W. by Hornsey and Wood Green, and E. by Walthamstow, it is served by rlys., underground rlys., and buses.



Tottenham arms

Tottenham is a residential and industrial area, giving its name to a bor. constituency. Pop. 129,000.

The parish church of All Hallows, founded in the 12th century, restored 1876, has a fine peal of bells; the Saints' Bell was the alarm bell to the garrison of Quebec taken at the siege in 1759. The brick and stucco High Cross, mentioned in Walton's Compleat Angler, is referred to in a court roll of 1456. Bruce Castle, belonging to the council, where a museum has been established, was once owned by Robert Bruce; it has been frequently reconstructed, and in 1827 passed by purchase to the Hill brothers and was used as a school. One of these brothers was afterwards Sir Rowland Hill. In Tottenham also are a town hall,



Totnes arms

central and five branch libraries, open-air bathing pool, 379 acres of open space, Harringay stadium and arena, and the ground of Tottenham Hotspur F.C. (*q.v.*). Seven Sisters Road is named from seven elms that once stood on Tottenham Green. *Consult* History of Tottenham, W. Robinson, 2 vols., 2nd ed. 1840.

Tottenham Court Road. A London thoroughfare. A link between Charing Cross Road and Hampstead Road, it is named after the prebendal manor of Tothill, Tottenham, or Tottenham Court, once belonging to the dean and chapter of S. Paul's cathedral. The manor house stood at its N.W. extremity; and in front of the tea gardens attached to the Adam and Eve inn, into which the house was transformed, Hogarth laid the scene of his March to Finchley. In Tottenham Court Road was Whitefield's Tabernacle (*q.v.*), destroyed by one of the last German rocket bombs, March 25, 1945. The thoroughfare has long been a centre of the furnishing trade.

Tottenham Hotspur. English professional Association football club. It was founded in 1882 by boys associated with a Tottenham Presbyterian school, who first played on Tottenham Marshes, and later acquired an enclosed ground in the neighbourhood. In 1899, four years after professionalism was adopted, they removed to their present ground at White Hart Lane, High Road, Tottenham. The Spurs were elected to the Southern League (later the Third Division of the Football League) in 1896, and remained in it for eleven years. In 1909 they were promoted to the premier division, from which they were relegated in 1915, to go up again in 1920, down 1928, up 1933, and back to the second division 1935-50. In 1901 they won the F.A. Cup for the first time, defeating Sheffield United by three goals to one, after a draw. They won the trophy again in 1921, defeating Wolverhampton Wanderers by one goal to nil.

Totternhoe Stone. In geology, a hard rock band occurring in the lower Chalk near Dunstable, Beds, also in Herts and Cambs. It is locally used as a building stone. *See* Cretaceous.

Tottington. Urban district of Lancs, England. Lying 2½ m. N.W. of Bury, it has two rly. stations. Cotton is spun and woven, while artificial silk manufacture has superseded calico printing. Pop. 6,532.

Touaris or **THOUERIS.** Grecised form of Taurt (*q.v.*), generic name of an Egyptian goddess of childbirth in the ungraceful form of a hippopotamus. Many local names and epithets were also used, such as Apet, Hesamut, Rert, Smet, and Shapuit.

Toucan. In astronomy, a southern circumpolar constellation placed by Bayer near the Lesser Magellanic cloud to the S. of Phoenix.

Toucan. A family of birds (Rhamphastidae) of the sub-order Picidae or woodpeckers. Found



Toucan. Green-billed species of the fruit-eating South American bird

in the forests of central and tropical S. America, they possess gaudily coloured beaks, which, though huge, are thin and light. There are more than 60 species of toucans, and they are very common in the forests of Brazil, notwithstanding the diligence with which the natives kill them for food. They feed mainly on fruit.

Touch. One of the five senses. The special organs which convey impressions of touch to the brain are minute corpuscles and bulbs situated in the skin in close association with the fine filamentous terminations of nerves. These corpuscles are of several varieties, and it seems probable that different forms convey different sensations, some receiving purely tactile stimuli, while others convey sensations of heat or cold or pain. The sensitiveness of the skin to stimulus depends upon the number and variety of the end organs receiving the stimulus, and these vary widely in different parts of the body.

Tactile sensation is most acute over the tip of the tongue. The points of a pair of compasses will be recognized as two points when applied to the tongue, if they are separated by only 1-24th of an inch. On the tip of the forefinger the distance must not be less than 1-12th of an inch before two points are felt; on the palm of the hand 5-12ths; and on the back of the body and many parts of the limbs the separation must be as much as

1 to 2 ins. An area sensitive for one set of impressions is not necessarily equally sensitive for another type of stimulus; for instance, the cheek and forearm are more sensitive to heat than the forefinger: hence the habit of testing the temp. of hot water by dipping the elbow into it.

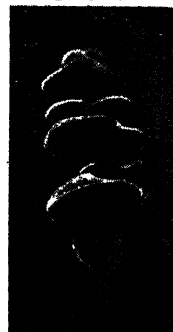
Anæsthesia is loss of sensation of touch, and may be hysterical or a symptom of various nervous diseases. Hyperæsthesia means excessive sensitiveness to normal stimuli. Paraesthesia is perversion of sensation, a stimulus not producing its usual effect; for instance, a touch is felt as pain. In syringomyelia there is loss of the sensations of pain, heat and cold, while sensation of touch remains.

Touch-me-not. Popular name of a British plant (*Impatiens noli-tangere*), so called because at the slightest touch its seed-pods throw out their seeds. It belongs to the order Balsaminaceae. *See* Balsam.

Touchstone or **LYDIAN STONE.** In mineralogy, a hard black variety of quartz. The stone is used for making a rough approximation to the fineness of gold. The latter rubbed across the stone leaves a streak which is moistened with a mixture of nitric and hydrochloric acids. A comparison of the effect of the mixture on streaks made with alloys whose composition is known enables the expert to determine approximately the fineness of the gold being tested. The stones originally used for this purpose were a bituminous quartz from Lydia in Asia Minor.

Touchstone. Jester in Shakespeare's *As You Like It*. He is described by the exiled duke as one who under the guise of folly shoots his wit. There is little kindness in Touchstone's wit, which results in the discomfiture of rustic characters. But he shows great devotion to Celia and Rosalind when accompanying them into the forest of Arden, where he finds a bride in Audrey.

Touchwood (*Fomes igniarius*). Woody fungus of the family Polyporaceae, very destructive to trees. The visible portion is a hard, hoof-shaped bracket c. 6 ins. wide,



Touchwood growing on a beech trunk

with concentric zones above, ultimately black. The underside is convex and cinnamon-coloured. New growths are added to the margin and underside each spring. Thin slices of the woody material, if ignited, will smoulder until consumed.

Tough Pitch Copper. Term describing the form in which copper is usually marketed. If all the gas is removed from commercial copper, the surface of a cast billet is uneven and the metal is brittle. But if some of the oxygen, introduced to the metal for refining purposes, is left in the copper as Cu_2O , the surface of the cast ingot is flat and the metal is in the highest degree malleable at all temps. It seems that the oxygen locks up the impurities in the metal and renders them harmless.

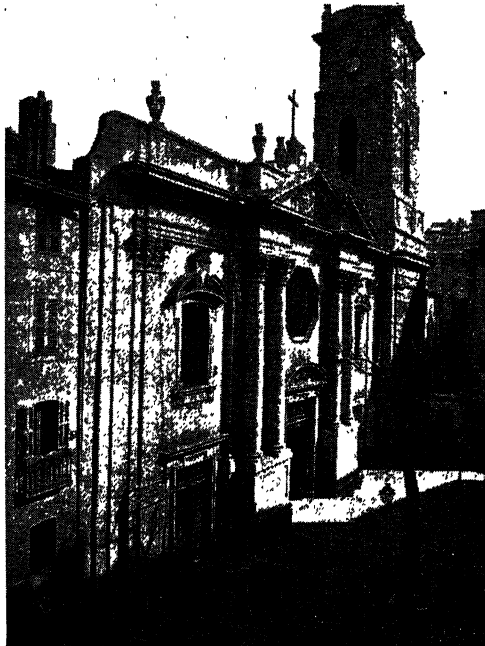
Tougourt, Touggourt, or Tugurt. Oasis in the Sahara. It is in Algeria, 295 m. S.S.E. of Algiers. In it is the walled town of Tougourt, which trades in the dates that abound in the oasis. There is also a territory of this name; pop. 243,363. See Oasis.

Toul. Town of France. In the dept. of Meurthe-et-Moselle, it is 14 m. W. of Nancy, and stands near the Moselle. The chief building is the church of S. Étienne, famous for its elaborate W. front and cloisters. This was formerly a cathedral. S. Gengoult is a fine Gothic church, also notable for its cloisters, while the hôtel de ville was formerly the bishop's palace. The industries include the manufacture of pottery and lace. Toul was the Roman Tullum Leucorum, and about 350 was made the seat of a bishop. It afterwards became a free city of the Empire. In 1552 it was taken by the French and made into a strong fortress, ranking with Verdun and Metz. It capitulated to the Germans in 1870, but was restored to France at the peace. In German-occupied France from June, 1940, it was liberated by Patton's U.S. 3rd army during a rapid advance to the Moselle in Sept., 1944. Hilaire Belloc's Path to Rome begins at Toul.

Toulon. Town and seaport of France. It stands on a bay of the Mediterranean, in the dept. of Var, 42 m. E.S.E. of Marseilles, with which there is rly. connexion. One of the chief naval stations of France, it is strongly fortified, its defences being on the hills which command the



Toulon arms



Toulon, France. Façade and belfry of the 12th century Romanesque church of S. Marie Majeure, formerly the cathedral

bay. It has a good harbour with five basins, and its dockyards cover 240 acres and can accommodate the largest battleships. Connected with it are a large arsenal and other naval establishments. The town has shipping and steamboat services.

The buildings include the church of S. Marie Majeure, formerly the cathedral. Romanesque in style, it dates from the 12th century and has some fine decorations. In front of the hôtel de ville is a bronze statue representing navigation. Other buildings are the church of S. Peter, hospitals, casino, and a fine modern building for the museum, art gallery, and library. The site of the fortifications has been built upon, and since 1860 the town has been greatly extended to the N. The chief square is the Place d'Armes. Industries include shipbuilding and fishing, and the town has a service of electric tramways. Pop. 125,742.

Toulon, the Roman Telo Martius, was taken by Charles of Anjou in 1259, by the constable of Bourbon in 1524, and by the emperor Charles V in 1536. The port dates from the reign of Henry IV. Outside it the British were defeated in 1744, by the combined French and Spanish fleets. Toulon was occupied in 1793 by the British,

who were forced to retire by the French Republicans, among whom Napoleon was first heard of as an artillery officer.

Toulon lay in unoccupied France under the terms of the Franco-German armistice of June, 1940, and here, under the same terms, a large part of the French fleet was laid up. When, following the Allied landings in French N. Africa, the Germans on Nov. 11, 1942, entered Vichy France they undertook, Nov. 12, that Toulon would not be occupied; but on the 27th, having cut all communications

between that port and the rest of France, (which meant that Admiral Jean de Laborde, the naval commander, never received Pétain's transmission of an order from Von Rundstedt to surrender the fleet), and dropped magnetic mines at the entrance to the port, the Germans entered the Toulon area. De Laborde, in accordance with orders given him at the time of the armistice, immediately gave orders to scuttle his ships, and 230,000 tons of naval shipping, including the 26,000-ton battleship Strasbourg, lay half-submerged in Toulon harbour. The Germans attempted to raise the vessels, but salvage was interrupted by frequent Allied air raids. French forces under Gen. de Lattre de Tassigny advanced to take Toulon after landing to the E. in Aug., 1944. The Germans lost the city on the 26th, surrendering in the fortified peninsulas across the bay on the 28th. The naval base was found destroyed.

Toulouse. Fourth largest city of France, capital of the dept. of Haute-Garonne. It stands on the Garonne in a wide plain, the Gate of Toulouse, 120 m. due W. of Montpellier. Built on both sides of the river, it is a manufacturing and market town, being served by a network of rlys. and waterways, including the Canal du Midi.

The old town is on the right bank of the river; around it on both sides are modern suburbs. Industries



Toulouse arms

include making silk and woollen goods, flour, tobacco, agricultural implements, and boots and shoes, and it is a market for the agricultural produce of Languedoc, and a banking and commercial centre. It has an archbishop.

The cathedral, of various periods, has a choir with 17 chapels. The church of S. Sernin is the largest and one of the finest Romanesque basilicas in existence, and has a fine octagonal tower. The beautiful church of the Jacobins is notable; and so are Notre Dame du Taur, Notre Dame la Blanche, called La Dalbade, and the 18th century Notre Dame la Daurade. The museum of fine arts, occupying a convent built in the 14th century, contains a remarkable collection of pictures, sculptures, antiquities, etc., and there is also the museum of S. Raymond. A square tower, the donjon, was restored in 1880 to hold the city's records. The Château Narbonnais, once the residence of the counts and the seat of the parlement, is now used as law courts. Other buildings are the Capitole, or city hall, the palais de justice, the Hôtel Dieu, and the observatory. Toulouse university, founded about 1230 and once famous as a school of law, has faculties of law, medicine, and science.

There is a fine old 16th century bridge across the Garonne, and two modern ones. The chief squares are the Place du Capitole and the Place Lafayette. Toulouse is a centre of art and learning, still retaining some features of a provincial capital. The academy of floral games, founded in 1323, exists mainly to preserve the language and literature of Languedoc. Pop. 264,411.

The town of Tolosa, which existed before the Romans conquered the district, was the capital of the Visigoths from 419 to 507, when it came under the Franks and was one of their greatest cities. It was famous as the

seat of a powerful family of counts, 778-1271, and a stronghold of the Albigenses, c. 1200. It was united with France in 1271, but remained the capital of the province of Languedoc until the Revolution. Throughout the Middle Ages and afterwards it was a storm-centre, religious strife being responsible for sieges and massacres. Wellington's victory here is described below. Toulouse was a municipality in the 12th century, and for long was governed by consuls. From 1443 it had a parlement, the most important in the S. of France. In unoccupied France under the terms of the Franco-German armistice of June, 1940, Toulouse was occupied by the Germans from Nov. 11, 1942, until liberated by the maquis Aug. 20, 1944.

Toulouse, BATTLE OF. Last action in the Peninsular campaign, fought on April 10, 1814. After defeating Marshal Soult at Orthes, Feb. 27, Wellington followed up his victory by the capture of Bordeaux, March 8, Soult retreating before him towards Toulouse with the intention of acting in union with Suchet's army in Catalonia. Wellington, in close pursuit, crossed the Garonne and attacked Soult on the heights E. of Toulouse, winning a rather doubtful victory at a cost of between 7,000 and 8,000 men. The battle was fought in ignorance of the fact that Napoleon had already abdicated.

Toulouse-Lautrec, HENRI MARIE RAYMOND, COUNT DE (1864-1901). A French painter. Son of Count Alphonse de Toulouse-Lautrec-Monfa, he was born at Albi, Nov. 24, 1864. As a boy he broke both legs, this accident retarding growth and giving him a grotesque appearance. Unwelcome in society, he sought the friendship of painters, studied with Bonnat, and in 1885 met Degas, through whom he discovered his vocation. He became a patron of Montmartre music

halls, his wealth and brilliance attracting artistic celebrities; he sketched Yvette Guilbert, Van Gogh, Wilde, and such night-club favourites as La Goulue. In 1899 his health broke down and he was confined to a sanatorium, dying Sept. 6, 1901. Toulouse-Lautrec depicted with unerring subtlety the night life of bohemian Paris. Drawings, posters, etchings, and lithographs (often on ordinary cardboard) revealed his infallible judgement upon human psychology, and acute observation of frailties and vice. He was unsurpassed in his own line. Most of his sketches are at the Musée d'Albi, but he is represented also at the Luxembourg, Paris, and the Metropolitan Museum, New York.

Toungoo. Dist. and town of Burma, in the Tenasserim division. The dist. lies S.W. of Karenni, along the middle course of the Sittang, and is crossed by the rly. from Rangoon to Mandalay. As rainfall is 150 ins. annually, rice is the only crop. Area 6,172 sq. m. Pop. 474,588. The town is on the right bank of the Sittang and on the rly.

Touraco or TURACOU. Alternative name for a family of African arboreal birds, known as the plantain-eaters (*g.v.*).

Touraine. One of the provinces into which France was divided before the Revolution. It is named from Tours, its capital, which was about its centre. The Loire ran through the district, which is still one of the most fascinating parts of France. It was ruled by counts as early as the 9th century, and in the 11th was united with Anjou. It formed part of the kingdom ruled by Henry II of England, but in 1204 was regained by France and made into a duchy. At present it is represented by the dept. of Indre-et-Loire and part of Vienne.

Tourane or TURANE. Seaport of N. Vietnam. It was one of the Annamese treaty ports open to European commerce, and is on the China Sea, 50 m. S.E. of Hué. Coal is worked at Nongson in the neighbourhood.

Tourcoing. Town of France. In the dept. of Nord, it is 2 m. N. of Roubaix, which forms with it virtually a single town. Almost on the Belgian border, Tourcoing is a great centre for the manufacture of woollen goods and other textiles, including cotton, and has large mills for spinning and weaving. Carpets, machinery, hosiery, and soap are also pro-



Toulouse, France. Church of S. Sernin showing the unfinished west portal

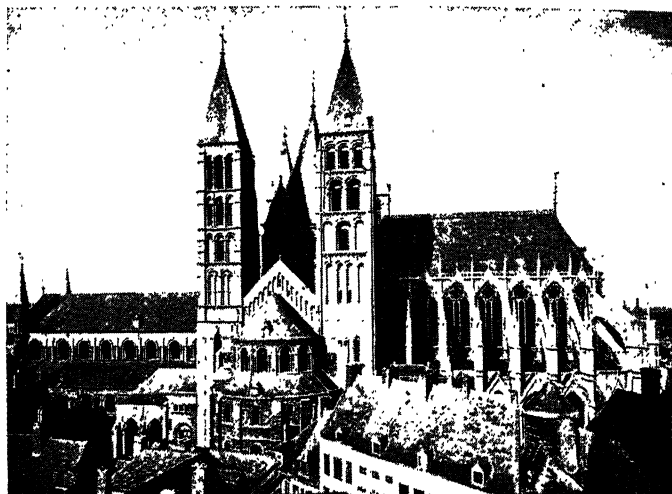
duced, and there are dyeing establishments and sugar refineries. The buildings include the exchange, churches, schools, etc. The town has been celebrated for wool since the 12th century. After being in Flanders it was taken by France in 1477. Here in 1794 the French defeated the Austrians. Tournai was occupied by the Germans 1914-18 and 1940-44. Pop. 76,080.

Tourist Industry. Business of catering for tourists. In France and Switzerland this became a major industry during the 20th cent., and the money spent by tourists constituted the return for an important invisible export in the national trade of those countries. Until after the Second Great War, Great Britain made little effort to attract foreign visitors, but each year their numbers increased. Between 1933 and 1938 the average number of foreign tourists yearly in the U.K. was 300,000, of whom 100,000 were American, 70,000 French; there were 250,000 dominion and colonial visitors, and 100,000 week-end trippers from France and Belgium. In 1938 the total income from these visitors was £31,000,000, or 80 p.c. of the value of British coal exports.

After the Second Great War, lack of dollar currency led most W. European countries to make elaborate plans to attract tourists, particularly from the U.S.A. In 1947 some 380,000 persons came to Great Britain and spent approx. £20,000,000, excluding air and sea transport fares. The Travel Association and the British tourist and holiday board were the organizations mainly responsible for encouraging them, with posters and brochures for display and distribution abroad. The number of British tourists to foreign countries was severely limited by restrictions placed on the amount of money each individual was permitted to take out of the country. Before the war, British tourists were spending abroad an annual average of £37,000,000.

Tourist Trophy. Name of two road races for mechanically propelled vehicles run in the U.K. The senior event is the T.T. for motor cycles, held in the Isle of Man and first run in 1907. The course is over 37 m. 1,300 yds., starting just outside Douglas; it contains many corners and other hazards, and there are gradients up to 1 in 10.9. Competitors have to complete seven laps, and the race is run in three

separate classes, senior, junior, and lightweight, for machines not exceeding 500, 350, and 250 c.c. respectively, one day being set aside for each class. The motor car event in Ulster is described under Ards Circuit.



Tournai, Belgium. Cathedral of Notre Dame, which dominates the city

Tourmaline. In mineralogy, a complex aluminium borosilicate containing varying proportions of alkaline metals, iron, or magnesium. Many varieties are known, and the mineral may be transparent or opaque, and range from colourless through blue, green, red, and brown to black, with a glassy lustre. Several coloured varieties are highly prized as gemstones.

The common tourmaline is black, and better known as schorl. It is found in fibrous masses, grains, etc., and gives its name to schorl rock with quartz, schorlaceous granite when feldspar is present, etc. Tourmaline is remarkable for being the most dichroic of all gemstones, and is therefore used in types of optical apparatus. The property is made use of in the optical instrument known as the tourmaline tongs. Blue tourmaline, known as indicolite, resembles sapphire; the red variety is known as rubellite or Siberian ruby, many fine specimens being found in Siberia; the green variety from its occurrence in Brazil, as Brazilian emerald; yellow tourmaline, found in Ceylon, is known as peridot; and the colourless variety as achroite. Tourmaline is a common accessory in granites, pegmatites, and adjacent metamorphic rocks; and often found in tin ore veins.

Tournai (Flemish, Doornyk). City of Belgium, in the prov. of Hainault. It lies on the Schelde, 52 m. by rly. W.S.W. of Brussels and 16 m. E. of Lille, and is a busy rly. junction. Industries are carpet making (Brussels carpets),

tanning, quarrying, and those concerned with hosiery, chocolate, chalk, and cement. There is busy river traffic, especially in coal from the Mons coalfield. Tournai is the seat of a bishop, and a military centre.

The cathedral of Notre Dame dominates the city, its central tower surrounded by four others almost as high. The nave and transepts are Romanesque of the 11-12th centuries; the choir is 14th century Gothic. There are many fine sculptures, notably on the N. portal, the main façade, and on capitals in the nave. Other churches of note are those of S. Quentin, 12th century Romanesque but much altered; S. Brice, 12th century, with the tomb of King Childeric; and S. Jacques, Transitional Gothic. The 13th century Pont des Troues over the river and the massive Tour de Henri VIII (1513) are remains of old fortifications. The 12th century belfry with carillon (236 ft.), restored in 1874, is on the Grand Place, where is also the 17th century Renaissance cloth hall, now a museum with antiquities and paintings. Pop. 31,490.

Tournai, the Roman Turnacum, was the Merovingian capital in the 5th century, and became part of the Spanish Netherlands, 1525. Taken by the French, 1745, it was added to the Netherlands, 1748. In the First Great War it was



Tournament. A miniature depicting a 15th century joust, in which also is seen the "tilt," or longitudinal barrier, introduced at this time to preclude direct collision, and reduce the danger of serious injury to the contestants

entered by Germans, Aug. 23, 1914, and retaken after sharp fighting by the British, Nov. 8, 1918.

In German occupation during the Second Great War from May, 1940, Tournai was liberated by the British 2nd army Sept. 3, 1944. At Hertain near by, where the first British armoured car entered Belgium, a memorial column to the B.L.A. was unveiled 1949.

Tournament. Medieval mock combat between mounted men. Named from the tournament, or quick turning, of the horses, it appeared in Europe in the 11th century, and quickly grew in popularity both in France and England, where in the reign of Henry II it became necessary to prohibit tournaments owing to extravagant indulgence in them by the younger nobility. Tournaments were allowed later to be held under royal licence, and a classic account of one at Ashby in the time of Richard I is given in *Ivanhoe*, in which the customs and rules of such assemblies are graphically indicated. Froissart is also a mine of information. The essential feature was the single combat of knight with knight, each striving to unhorse or incapacitate his opponent, the usual weapon being the lance. Sometimes one body of knights fought against another body. Tournaments were arranged for most occasions of public rejoicing. Participation was usually reserved

for those of noble birth, and about the end of the 13th century a new set of rules was embodied in a statute of arms for tournaments, which laid down, among other provisions, that disputes arising out of a tournament were to be settled by a court of honour composed of princes and earls. By the 16th century the tournament had degenerated until it was merely a form of pageant. The term is now applied to many kinds of games contests, e.g. lawn tennis tournament. At Olympia, London, there is normally held in June the Royal Tournament, a display by the British fighting services, dating from 1879. See *Chivalry*; *Eglinton Tournament*; *Knighthood*; *Tilting*; consult also *History of the T.*, F. H. Cripps-Day, 1918.

Tourneur, CYRIL (c. 1575-1626). English dramatist. He saw service in the Netherlands, and was secretary to Sir Edward Cecil in the unsuccessful Cadiz expedition of 1625, on the return of which he was landed with the sick at Kinsale, Cork, where he died, Feb. 28, 1626.

He wrote a satirical poem, *The Transformed Metamorphosis*, and two tragedies, *The Revenger's Tragedy*, printed 1607, inspired by *Hamlet*, and *The Atheist's Tragedy*, 1611, which in the opinion of Gosse "surpass in horror of iniquity and profusion of ghastly innuendo all other compositions of their time." Praised by Lamb, Hazlitt, and Swinburne, the plays and poems of Tourneur were collected and edited by J. Churton Collins, 1878.

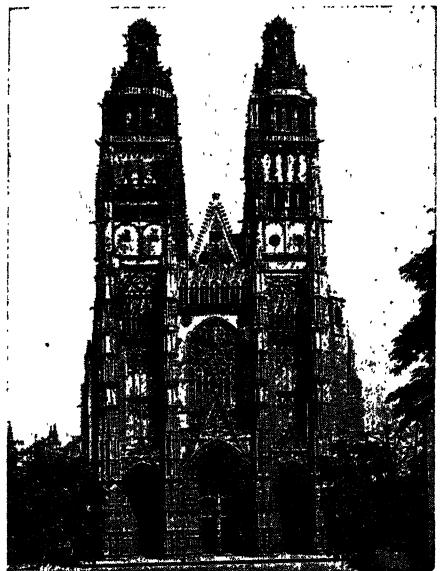
Tourniquet. Instrument, the essential part of which consists of a band passing round a limb, by which the blood-vessels can be compressed. It is used to stop bleeding, or to prevent hæmorrhage during an operation. See *First Aid*; *Hæmorrhage*.

Tours. Town of France. The capital of the dept. of Indre-et-Loire, it stands in the valley of the



Tours arms

Loire, on the left bank, between it and the Cher, and is connected by rly. with Paris, 145 m. to N.E. The Gothic cathedral of S. Gatien, partly destroyed in the Second Great War, had a façade of great beauty and towers 205 ft. in height, crested by cupolas. In a garden behind the cathedral are Roman walls and remains of an amphitheatre. The churches of S. Julien (another wartime casualty), Notre Dame, and S. Saturnin are notable.



Tours, France. Façade of the cathedral of S. Gatien before the Second Great War

S. Martin's is modern. The museum has a fine collection of paintings. Conspicuous features of the town are two towers, forming the only relics of the abbey church which was the shrine of S. Martin, the rest perishing in 1790. Industries include making iron and steel goods, boots and shoes, and machinery. Pop. 80,044.

Tours takes its name from the Turones, whose capital it was. Later it was a Roman city and about 250 was made the seat of a bishop. Its association with S. Martin made it famous ecclesiastically. Its abbey was also notable, and the city thrived on the gifts of the pilgrims who came to the shrine of S. Martin. Near here in 732 the Franks defeated the Saracens. Until the Revolution Tours was the capital of Touraine.

Tourville, ANNE HILARION DE COTENTIN, COUNT DE (1642-1701). French sailor. A Norman, he fought for the Order of Malta against Barbary pirates, and entered the French navy in 1667. On the outbreak of the Dutch war he commanded a vessel attached to the English fleet, was present at Sole Bay, June 7 (N.S.), 1672, and later fought against the Dutch in the Mediterranean, distinguishing himself at the battle of Palermo, 1676. Commander-in-chief of the French navy in 1689, he prosecuted the war against England and gained a barren victory over the earl of Torrington at the battle off Beachy Head, July 10 (N.S.), 1690. Two years later he unsuccessfully engaged the English fleet in the battle of La Hogue. In 1693 he was again in the Mediterranean but was crippled by lack of resources and saw no further action. He died in Paris, May 28, 1701.

Toussaint L'Ouverture (1746-1803). West Indian negro leader. He was born a slave on a plantation in Haiti,



Toussaint L'Ouverture, West Indian negro leader

In 1791, having aided his master with his family to escape, Toussaint took part in the negro insurrection, and in 1794 joined the French republicans. Appointed c.-in-c. of the island, by the French

convention in 1797, he drove out French royalists, British, and Spaniards, and brought the island into a state of tranquillity and prosperity. About 1800 he began to work for Haitian independence, and on the re-establishing of slavery by Napoleon refused to obey. He was betrayed to and captured by the French, May 7, 1802, imprisoned without trial, and sent to die in a dungeon at the Fort of Joux, Jura, where the end came on April 27, 1803. Wordsworth addressed him in a noble sonnet. *Pron.* Toosan.

Tovey, JOHN CRONYN TOVEY, 1ST BARON (b. 1885). British sailor who commanded the Onslow



Lord Tovey, British sailor

at Jutland and received the D.S.O. after the First Great War. He had charge of the Rodney during 1932-34, became rear-admiral next year, and at the outbreak of the Second Great War was in charge of British destroyers in the Mediterranean. In 1940 he took over command of the Home Fleet from Sir Charles Forbes, his flagship being King George V, from which he directed the chase and destruction of the German battleship Bismarck (*q.v.*). Admiral of the fleet, 1943, Tovey was given the Nore Command until 1946, and was principal naval A.D.C. to King George VI, 1945-46. Knighted 1941, he was made a peer in 1946.

Tovey, SIR DONALD FRANCIS (1875-1940). British musical scholar and composer. Son of an Eton master, he was born July 17, 1875, and soon showed remarkable musical gifts, mastering counterpoint before he was 10, and composing sonatas before entering Balliol College, Oxford, in 1894. He was a pianist playing chamber music in London, Vienna, and Berlin early in the new century. Appointed in 1914 Reid professor of music at Edinburgh, he held that post until his death, July 10, 1940. In 1935 he was knighted. One of the foremost musical scholars of his time, he raised the status of his subject in the



Sir Donald Tovey, British composer

university and helped to make Edinburgh a centre of musical learning. His quarterly notes for performances by the Reid orchestra were collected into 6 vols. of *Essays in Musical Analysis*. He solved the enigma of the unfinished final number of Bach's *Art of Fugue*, and wrote a short "companion" to it. On Bach he was an unsurpassed authority. His compositions included chamber works, a cello concerto written for Pablo Casals, and an opera, *The Bride of Dionysus*, produced at Edinburgh, 1929. *Pron.* Tuvvy.

Towcester. Town of Northants, England. It is 9 m. on the rly. S.S.W. from Northampton, and stands on Watling Street. The 11th century church of S. Laurence has a fine Perpendicular tower 90 ft. high. It contains an altar tomb (1448), old brasses and monuments, and some chained black letter books. A town hall in the Italian style is occupied by the rural district council. The Saracen's Head hotel (formerly Pomfret Arms) is referred to in *The Pickwick Papers*. The living of Towcester was held by Boniface VIII in 1294 when he was elected to the papal throne. A Roman station, the place is mentioned in *Domesday* as *Tovecestre*, a town of importance. It is an agricultural centre. Pop. 2,300. *Pron.* Towster.

Tower. In its widest sense, any structure that is high in proportion to its lateral measurements; in the narrower interpretation, a structure standing on the ground, and rising therefrom without any serious break in its verticality. According to the former definition, towers include the keep, the gateway towers, other projecting parts of a fortified place, the belfry, pagoda, lighthouse, campanile, even the pronounced "skyscraper."

The large Norman church had towers to mark the terminations of the aisles, and often another tower at the intersection of the cross. These were increased in height during the Early English period, the spire was added, and in the Perpendicular style tower and spire together achieve their limit of height and magnificence of decoration. The highest tower in the world, using the word tower in its strictest sense, is the Eiffel Tower in Paris, built of cast and wrought iron in 1889, and nearly 1,000 ft. high. The highest in the U.K. is that of Salisbury cathedral, which, including the spire, is 404 ft. See Babel, Tower of; Belfry; Campanile; Eiffel Tower; Pagoda; Pisa; Round Tower; Spire.

Tower Bridge. Bridge crossing the Thames near the Tower of London. Designed by Sir Horace Jones and Sir J. Wolfe Barry, it was begun April 22, 1886, and opened June 30, 1894, the total cost being more than £1,000,000. It car-

ries a roadway 49 ft. in width, with a central lifting or bascule span of 200 ft. and two side spans each of 270 ft. The total length, in addition to approach viaducts, is 880 ft. The main towers, rising more than 120 ft. from the river piers, consist of steel columns encased in masonry. The side spans are hung from suspension girder-links between the pier and abutment towers, the links at the shore ends being anchored in massed concrete.



Tower Bridge. Diagram showing construction. A, masonry towers enclosing steel piers; B, steel suspension plate chains holding C, the bridge, and D, overhead girders; E, bascules or cantilever roadway sections, shown raised; F, gearing for raising bascules; G, hydraulic operating motors; H, control and operating houses

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Between the suspension links the ties are carried on two overhead foot bridges between the tops of the towers. The centre or bascule span consists of two cantilever arms which meet in the centre, where they are locked by massive bolts, being hinged upon shafts inside and near the edge of each pier, and extending beyond the shafts inside the piers, where they are heavily weighted to counterbalance the weights of the projecting portions. Their inner ends are fitted with toothed quadrants engaged by gearing and operated by hydraulic machinery. To raise the bridge the centre locking bolts are drawn, the quadrants depressed, and the two leaves rise simultaneously to a vertical position against the towers, allowing 140 ft. between high-water level and the foot bridges. The average time taken by the raising and lowering of the central span is 5 min. When closed, it is 29 ft. 6 ins. above high-water mark.

Signals are provided by semaphores by day and signal lamps by night, to show navigators whether

the bridge is open or shut. The weight of steel and iron in the bridge is nearly 12,000 tons. See

Bridge illus., p. 1423; London; Thames; consult History, C. Welch, 1894.

Tower Hamlets. Name given to certain liberties in the vicinity of the Tower of London. They consist of districts in the boroughs of Poplar, Shoreditch, Stepney, and Bethnal Green, and the name is remembered chiefly because, before the Act of 1918, they returned 7 members to parliament, the Hamlets being divided for this purpose into the constituencies of Bow and Bromley, Limehouse, Mile End, Poplar, St. George's in the East, Stepney, and Whitechapel. The name is borne by the Tower Hamlets cemetery.

Tower Hill. High ground N.W. of the Tower of London. Here, on the site covered by Trinity Square Gardens, political prisoners were at one time executed. The wooden

scaffold was removed in the middle of the 18th century. Notable executions were those of More, Surrey the poet, Protector Somerset, Sir T. Wyatt, Strafford, Laud, Monmouth, Derwentwater, Kilmarnock, Balmerino, and on April 9, 1747, Simon Lord Lovat, the last to be beheaded in England. Lady Raleigh lodged on Tower Hill while her husband was a prisoner. Here William Penn was born and Otway died here. The adjacent quadrangle is used for open-air meetings and popular demonstrations. Tower Hill is also the name of an Underground rly. station, formerly called Mark Lane.

Tower of London. Ancient fortress, palace, and prison on the left bank of the Thames, one-third of a mile below London Bridge. It covers 13 acres. Apart from a section of Roman wall, its oldest structure is the White Tower or keep, built by Gundulf, William the Conqueror's bishop-architect, in 1078-80. This is 90 ft. high, 107 ft. N. to S. by 118 ft. E. to W., has three storeys, with exterior walls 15 ft. thick, and is divided by a 7 ft. wall running N. and S., while another wall running E. and W. sub-divides the E. division. On the first floor is Queen Elizabeth's armoury, originally the sub-crypt of S. John's chapel, one of the finest Norman chapels in England, 55½ ft. long, 31 ft. wide, and 32 ft. high. Underneath the S. staircase some children's bones found in Charles II's time were identified as remains of Edward V and his brother; they were removed to Westminster Abbey in 1678.

Other towers are Middle Tower, beneath which the visitor passes on entering the precincts; Bell Tower, so called from the alarm bell which formerly hung in the turret; S. Thomas's Tower, over Traitors' Gate, the old waterway entrance for prisoners; Garden or Bloody

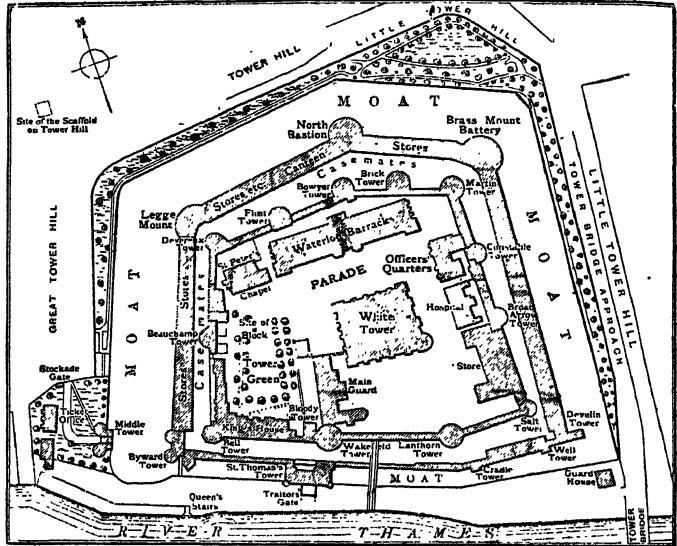


Tower Hill, London. Site of the scaffold, now Trinity Square Gardens, where many political prisoners of the 16th and 17th centuries were beheaded

Tower; Wakefield Tower, where the crown jewels are kept; and Beauchamp Tower. The palace, which stood between White Tower and the river, was pulled down by Cromwell. The refreshment room is on the site of the Lion Tower, where the royal menagerie was kept from the 13th century until 1834. N. of Tower Green, once a churchyard, also the site of a scaffold, is the church of S. Peter ad Vincula.

The Tower is surrounded by a moat, drained in 1843, between which and Tower Hill are gardens, and has Tower Wharf on the river front. Waterloo Barracks, to the N. of the White Tower, serve for the garrison. The corps of Yeomen Warders of the Tower wear the same picturesque Tudor uniforms as the Beefeaters (*q.v.*). In addition to the major, or resident governor, are the constable and lieutenant. The building has been repeatedly added to or altered, notably in the time of Henry II and Edward I. In the Second Great War the precincts received 15 H.E. and three flying bombs, which killed 23 people. Three out of every four American soldiers in England visited the Tower. See *Armoury illus.*; consult *Histories of the Tower*, W. H. Dixon, 1869; Lord Ronald Gower, 1901; R. Davey, 1910; W. G. Bell, 1921.

Town (A.S. *tun*, hedge, enclosure). Originally the name given to the primitive settlement of the community surrounded by a hedge. As population grew and commerce developed, a town became distinguished from a village. In England the distinction was popular rather than precise and legal, except in the boroughs and cities. It was based merely on size and importance, on the development of industries, and on the growth of markets. The circumstances which caused some villages to outstrip



Tower of London. Plan of the ancient buildings and barracks

their neighbours and to become social and economic centres were various. Crossroads, fords, bridges across rivers, seaports, and harbours attracted settlers and favoured intercourse. Monasteries

gathered communities round them; feudal castles required an urban population for their maintenance and equipment; royal palaces became centres of population. See *Borough*; *City*; *Municipality*.

TOWN AND COUNTRY PLANNING

John Mumford, formerly Director of the Town and Country Planning Association

Some account of early town planning and its later development into town and country planning, with particular reference to the U.K. and some notes on reconstruction, after the Second Great War, on the Continent. See also Barlow Report; Coventry; London; Netherlands; Scott Report; Ulhwatt Report

Probably one of the strongest early factors leading to the planning of urban communities was the need to adopt the best patterning of houses, streets, and boundary fortifications for defence. Joined to this elementary need for safety was the need people felt for the added warmth and variety of living in communities. Banded together they felt themselves more

secure from the perils of man, nature, and the supernatural. The very word civilization means town-life, and town-life has formed the main source of the growth both of the arts and of industrial life.

The builders of the ancient cities of Egypt, Mesopotamia, and the Indus valley left a lasting impression on town-form, but it fell to the Greeks and Romans to establish patterns which are plainly recognizable today. The Greek philosophers, notably Plato and Aristotle, had significant remarks to make on the form of the town, necessary limitations to its size, and its relation to a surrounding agricultural region. Both the grid-iron and radial patterns stem from Greek and Roman times.

It is often claimed that William the Conqueror built the first post-Roman planned town in England at Winchester, but the heyday of English town-planning came in medieval times. Unlike its more turbulent Continental neighbours, England, protected by its surrounding seas, could early afford to allow its towns to develop on a more spacious pattern dictated by methods of govt. and economic organization, rather than by the necessity of building houses close together inside "impregnable" city walls. On the Continent the conditions of an uncertain life early forced kings and rulers to impose

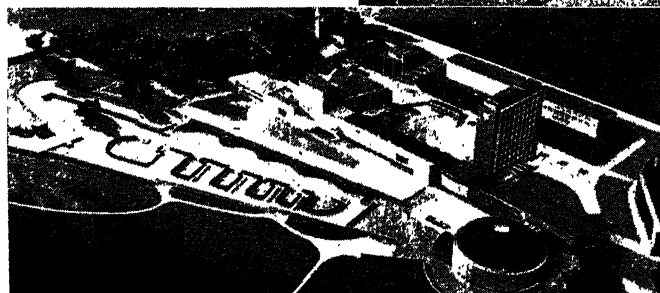


Tower of London from the air. The buildings constituting the Tower can be identified from the plan at top of page. The narrow belt of trees beyond the drained moat is a public garden

legal directives concerning the building of towns. In Sweden, for example, there was a general town-law as early as 1350.

More's Utopia (1515-16) contained an early hint of the 20th cent. garden city idea. The 54 cities of Utopia were 20 m. or so apart, with a predetermined relation between town and country, the farmers coming into the city at monthly intervals and the townsmen being skilled in husbandry. A vigorous opponent of suburban sprawl, specifying that if a city grows beyond capacity the Utopians "fill up the lack in other cities," More also anticipated Howard, Lewis Mumford, and other social theorists of the 20th cent. by making his Utopians insist that city children should have access to the country.

The 16th and 17th cents. in England saw successive enactments from Elizabeth onwards aimed at prohibiting the suburban expansion of London by throwing a green girdle round London. The



Town and Country Planning. Architectural models of the proposed town at Harlow, Essex, as it will appear from the air. Planned by Frederick Gibberd, F.R.I.B.A., under the New Towns Act, 1946, it will replace the existing town. Top, the proposed town centre, from the north. In the foreground is the radial road from London to Cambridge, and beyond, left, the main sports area. The civic centre, on top of the hill, is connected to the market and business buildings by shopping streets. Lower picture, the proposed civic centre

present strangled state of London is an ironic commentary on mankind's cupidity in the intervening centuries.

Between the 17th and 19th cents., planned towns both small and great arose in Europe. For example, Karlskrona in Sweden was born of the necessity for a Swedish naval port in the S. Baltic during the war of 1675-79, when Sweden had to fight for her life against eight hostile powers. In its plan this town has been called "more Roman than Rome itself." At the other end of the scale comes Paris, rebuilt under Napoleon III's orders to the magnificent radial plan of Haussmann from a vast insanitary huddle of narrow, twisted streets and tumbledown houses. In

England the 18th and early 19th cents. witnessed the architectural and planning glories of Bath, Cheltenham, and Brighton, while in the U.S.A., Maj. Pierre Charles l'Enfant left in Washington, planned in 1791, a fine example of adequate planning of streets and open spaces.

Suddenly the picture changed—most notably in England. With the rise of the great English industries the need came to house the thousands of workers attracted, by the wages offered, to the factories. Mile after mile of mean streets of houses almost totally without light, air, water, or sanitation clustered as closely as possible round the noisy, smoking mills. Year after year the balance of urban and rural life grew more distorted, while the

rapid rise in the birth rate increased still more the congestion in each dwelling.

But the light of planning was not entirely extinguished even in the 19th cent. James Silk Buckingham and Robert Owen furthered plans to bring back sanity to English town-life; but Ebenezer Howard's *Tomorrow: A Path to Peaceful Reform*, 1898 (called in subsequent eds. *Garden Cities of Tomorrow*), produced the first effective attempt to halt chaotic expansion of English cities and towns. Starting from the necessity of dispersing people from the overcrowded cities, Howard conceived of a balanced community working, playing, and living to the full in an urban framework of light and air and culture where a permanent green belt banished unplanned overgrowth for ever. With the cooperation of Raymond Unwin, F. J. Osborn, and others Howard saw his ideas take physical shape in Letchworth, and Welwyn Garden City. His influence was also seen in the creation of Hampstead Garden Suburb and Wythenshawe, and in the common acceptance of twelve houses to the acre as the suitable maximum density in suburban development.

In 1909 Great Britain passed her first Planning Act and took a first fumbling step towards planning administration. While voluntary bodies such as the town and country planning association were gathering together all the amateur enthusiasts for planning, professional planners, architects, engineers, and surveyors banded together in the town planning institute, the world's first professional planning body.

Despite new Planning Acts in 1925 and 1932, however, the face of the U.K. continued to change for the worse. Between 1919 and 1939 four and a half million houses were built, and London spread ever outwards until it seemed that only the sea could halt its growth. By the time the Restriction of Ribbon Development Act, 1935, was passed there was already speculative housing built along the new motor roads.

When the Second Great War started, building stopped, and bombing cleared, or partially cleared, many highly congested areas. In order to take advantage of this situation when the war should be over, three committees were set up; they published the results of their consideration in the Scott report on land utilisation in rural areas; the Uthwatt report on compensation and betterment; and the Barlow report on the distribution of the industrial pop.

The Town and Country Planning Act, 1944, gave power to local authorities to purchase compulsorily "blitzed" areas and associated areas of bad and out of date development. Schemes were formulated for the replanning and rebuilding of London, Plymouth, Exeter, Coventry, Manchester, and many other cities and towns. By 1948, Coventry and Plymouth had begun their proposed reconstruction. The Town and Country Planning Act of 1947, which came into operation on July 1, 1948, transferred primary responsibility for planning from 1,440 local authorities to 145 C.C.'s and co. bors., which were in turn made responsible through 11 regional offices of the ministry of Town and Country Planning (*v.i.*) to the minister himself. Every executive authority was bound by law to produce a development plan of its area within three years of the coming into force of the Act, the plan being subject to necessary revision every five years. The Act also transferred the "development value" of land to the state: i.e. land had to change hands at its

value for its existing use, and not at a price representing any value which might have been deemed to have accrued to it through expectation of another use. As a corollary, anybody wishing to develop his land for a new use had to pay a development charge to the state representing the difference between its value after its use had changed and its existing use value. For practical purposes the existing use value of land was taken roughly as its value as farming land of the appropriate quality. As practical illustrations, if agricultural land was used for building houses, or if a house was transformed into a shop, a development charge arose. Before the passing of the 1947 Act, a local authority had frequently been unable to say "no" to an undesirable use of a particular piece of land because it could not afford to pay the inflated price it would have carried when the authority's wish to purchase it became known. The Act prevented such inflation. But the Act recognized that hardship might result from these provisions if land had already acquired a potential high value and a sum of £300,000,000 was set aside to meet cases of hardship. The central land board was set up to levy development charges, and to assess claims made on the £300,000,000 fund. Assessment was to be completed in five years, and payment made in 1953.

New Towns in the U.K.

The New Towns Act of 1946 was designed to establish a legal framework for the setting up of new towns, each of c. 60,000 pop., to accommodate the surplus populations of the overcrowded centres of London, Manchester, etc., in new self-contained communities. By the autumn of 1948 several sites had been decided on, e.g. in Herts Stevenage, Hemel Hempstead, Welwyn Garden City with Hatfield; in Essex Harlow; in Sussex Crawley. Two new towns had been designated in Scotland, and a new town for miners was under construction at Peterlee (*q.v.*). The New Towns Act laid it down that the towns were to be developed by public corporations.

Town and country planning in the U.K. also embraces the setting up of national parks, the best siting of training areas for the services, the creation of a national policy for the location of industry, and special questions such as the development of extractive industries in areas of special amenity. In any dispute between the citi-

zen and a planning authority, the minister must hold a public inquiry if called upon to do so, and must give a decision based upon the full evidence and upon the report of his inspector. More than a third of such appeals made up to 1948 were allowed. The range of these inquiries is very wide, covering replanning of a city, the establishment of a new town, and appeals affecting one individual.

European Reconstruction

On the continent of Europe, available information showed that the greatest efforts towards planned reconstruction were being made in the eastern half, where the devastation caused by the Second Great War had been heaviest. In Poland, for instance, the ministry of reconstruction had to recreate 14,000 industrial plants completely destroyed out of a pre-war total of 23,000. Warsaw (*q.v.*), 99 p.c. devastated, produced a plan which owed much to the plan for Manchester. All the land in the city was transferred to municipal ownership, and three chains of residential districts were designed around a new university and business centre. By 1948 large white blocks of flats were in course of construction. In Czecho-Slovakia, work on a new town called Litvínov, designed to house 70,000 miners and their families, was started, the population to be drawn from scattered derelict mining villages. In Greece, seven experimental settlements were built in the most severely damaged towns.

"Panoramic planning" — the satisfactory grouping of buildings over several square miles — was a feature in Russia of the replanning of cities like Moscow. In general, Russian ideas on neighbourhoods, densities, and amenities, seemed to be moving towards those of the U.K., with increased appreciation of the small family house instead of blocks of flats. While grandiose planning schemes were projected, people, especially in the Ukraine, where all housing for areas covering many square miles had been swept away in the fighting, were urged and helped to build new houses for themselves. Three separate plans were made for a new Berlin, one, the Zehlendorfer plan, having been started two days after the surrender. Little, however, had been done to put them into effect up to 1948.

In the Netherlands, the rebuilding of Rotterdam took first place in city reconstruction. A plan prepared by the Dutch during the

occupation was formally approved in 1946. Even more urgent was the reconstruction of Walcheren (*q.v.*) and repair of damage due to flooding of new towns and farm-houses in N. Holland. The reclamation of the former Zuyder Zee, slowed down but never stopped during the Second Great War, continued.

In France Auguste Perret published an intricately geometrical and traditional plan for the rebuilding of Le Havre, and rebuilding of other wrecked towns was gradually undertaken; in Marseilles an enormous block of flats designed by Le Corbusier to house 15,000 people allowed for a density of 2,000 people per acre.

A problem confronting town and country planners of all lands is the choice and training of the planners of the future, for the day of the pioneer-planner, trained as architect, engineer, or surveyor, is passing, and planning must become a profession in its own right. A govt. committee was appointed in the U.K. in 1943 to consider the problem. The univs. of Durham, London, Edinburgh, Liverpool, and others established major courses in planning.

As scientist, the town planner must continually review standards of density, layout, and grouping. He must be able to assess the work of the economist, the geologist, and the building technician. In cities he must find new answers to such varied questions as how best to get the maximum of sun and air into lofty city blocks, how most economically to satisfy man's demand for warmth, and how to create the right pattern for contemporary communal living. In the country he must seek to create a pattern of interdependence of town, village, and open countryside, and to satisfy the recreational needs of the city dweller and of the villager without disrupting that pattern.

As artist the planner must be able to create whole new towns which are aesthetically satisfying. He must blend nature and art so as perpetually to refresh the soul of man as he goes about the task of earning a livelihood.

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1945; City of Manchester Plan, R. Nicholas, 1945; Problems of the Countryside, C. S. Orwin, 1945; City Development, Lewis Mumford, 1946; Cathedral City: A Plan for Durham, T. Sharp, 1945; Green-belt Cities, F. Osborn, 1946; Oxford Replanned, T. Sharp, 1948.

Town and Country Planning, MINISTRY OF. British govt. dept. It derived from the Minister of Town and Country Planning Act, Feb. 5, 1943, under which a minister was appointed with the duty of "securing consistency and continuity in the framing and execution of a national policy with regard to the use and development of land." To him were transferred all functions previously vested in the minister of Works and Planning (whose title was altered to minister of Works) and, as appropriate, those of any other ministers, relating to the use and development of land. The act also established a commission to exercise these functions under a new ministry. W. S. Morrison (*q.v.*) was the first minister of Town and Country Planning, 1943-45.

Town Clerk. Chief officer of a borough or county borough. He is both secretary and legal adviser of the council, and has therefore to inform it when necessary of the duties imposed on the members, and to draw their attention to any act proposed which either conflicts with those duties or exceeds the council's powers. He communicates officially on behalf of the council with central and with other local authorities, and these communicate through him with the council. A town clerk must be a barrister or a solicitor.

Town Council. Popular name for the administrative body which manages the affairs of a city or town. There are city councils, borough councils, urban district councils, and, in Scotland, burgh councils. See Borough; England (Local Government); Franchise; Local Government; Scotland (Administration).

Towneley, CHARLES (1737-1805). British collector. Born at Towneley Hall, near Burnley, Oct. 1,



Charles Towneley,
British collector
From a bust by
Nollekens

1737, he studied ancient art in Rome and Florence and, with the assistance of Gavin Hamilton and others, amassed a fine collection of marbles and terracottas, drawings, MSS., bronzes, gems

and coins. After his death in London, Jan. 3, 1805, the marbles, terracottas, and bronzes were bought by the British Museum.

Towneley Plays or MYSTERIES. Collection of early dramatic pieces. Probably made about the close of the 14th century, they were preserved in the library of Towneley Hall, Lancs. There are 32 pieces presenting the Bible story, from the Creation to Doomsday, in a familiar and sometimes broadly humorous fashion. At Sotheby's on Feb. 8, 1922, the MS. went to Dr. Rosenbach of Philadelphia for £3,500. The Towneley Mysteries were printed for the Surtees Society, 1836. Consult History of English Dramatic Literature, A. W. Ward, 1899.

Town Hall. Building where the administrative business of a city or town is carried on. The term city hall is less frequently used. Almost every town has its town hall, although some are known as municipal buildings, while in others, *e.g.* the city of London, the older term guildhall is retained. There are rooms for the meetings of the town council, and for the various departments of its work. Many town halls include a large assembly hall that is let out for public meetings, etc.

The French and Belgian equivalent of the town hall is the *hôtel de ville*. Those in Paris and Lyons are modern, but there are fine old ones at Rouen, Compiègne, and elsewhere. Those of Belgium, especially Bruges, Brussels, and Antwerp, are notable. In Germany and Austria the Rathaus is the town hall.

Townshend, MARQUESS. English title borne by the Townshend family since 1787. The founder of the family was Sir Roger Townshend, created baronet in 1617. His younger son, Sir Horatio, was made a baron in 1661, being raised to viscount in 1682. His heir is noticed below. The 4th viscount, George, a distinguished soldier, in 1787 was created Marquess Townshend. The title passed to his grandson George, who on dying in 1855 was succeeded by his cousin John. Charles (b. May 13, 1916) became 7th viscount in 1921.

Townshend, CHARLES TOWNSHEND, 2ND VISCOUNT (1674-1738). British politician. The eldest son of Horatio, Viscount Townshend, he came into the title in 1687. Educated at Eton and King's College, Cambridge, with Robert Walpole as companion, and brought up in Tory principles, he soon became prominent in the house of lords

as a Whig. After some diplomatic experience in the Netherlands, he was chosen in 1714 a secretary of state, and became one of the leading ministers of George I. In Dec., 1716, he left office, but returned in 1720 as president of the council. He was a secretary of state 1721-30, his brother-in-law, Walpole, being his chief colleague. This peer, who died at Raynham, June 21, 1738, was known as Turnip Townshend, from his interest in agriculture. His grandson, Charles Townshend (1725-87), was the chancellor of the exchequer who in 1766 imposed taxes on the American colonists.



2nd Viscount
Townshend,
British politician

Townshend, Sir Charles Vere Ferrers (1861-1924). A British soldier. Born Feb. 21, 1861, grandson of Lord George Townshend, he entered the Royal Marines, and saw service in the Suakin operations and in the Nile expedition. In 1886 he transferred to the Indian Staff Corps, and in 1891 accompanied the expedition against the Hunza and Nagar tribes. He first came into prominence by his gallant defence of Chitral (q.v.), for which he was awarded the C.B. He was at Atbara and Khartum, 1898, and in the S. African War.



Sir Charles
Townshend,
British soldier

In 1900 he was transferred to the British army (Royal Fusiliers). He became major-general, commander of a territorial division, and in 1913 returned to India. Early in 1915 he was sent to Mesopotamia at the head of a division, and after gaining several victories, had to retreat to Kut, which he defended for five months. Taken prisoner after its fall, Townshend was interned in Prinkipo Island.

Townshend was knighted, 1916, and resigned from the army, 1920. That year he was returned to parliament as independent member for Wrekin, joining the Conservatives in 1922. He died May 18, 1924. See Otesiphon; Kut; Mesopotamia Campaign; consult his Campaign in Mesopotamia, 1920.

Township or Vill. Territorial division of Anglo-Saxon and medie-

val England. In pre-Conquest times the township (A.S. *tūnscepe*) was the area occupied by the inhabitants of an enclosed homestead or village. Later it was applied to the community of inhabitants of a manor or parish within a hundred (q.v.). In the U.S.A. a township is a sub-division of the county, with varying powers of local govt.

Townsville. Seaport and city of N. Queensland. It stands on Cleveland Bay, 832 m. by rly. N.W. by N. of Brisbane. Its harbour serves as outlet for the sugar-growing area of the N. and the pastoral districts of the N.W. There are meat factories and rly. workshops. Townsville was raided by Japanese aircraft in Feb. and Sept., 1942. Pop. 34,233.

Towton, BATTLE OF. Conflict in the Wars of the Roses. It was fought in a snowstorm on Palm Sunday, March 29, 1461, between Yorkists, nominally under young Edward IV. and Lancastrians. Towton is a parish near the Great North Road, midway between York and Leeds. The Lancastrians, nearly 60,000, had behind them the river Cock, but the weather blew in their faces, allowing the less numerous Yorkists to do deadly execution with arrows. About half the former army either perished in the battle or were drowned trying to escape across the stream, and some 8,000 dead Yorkists were afterwards counted. This was one of the bloodiest battles ever fought in England.

Towy. River of Wales. It rises among the hills that divide Cardiganshire from Radnorshire, and flows mainly S.W. until it falls into Carmarthen Bay at Llanstephen. Its length is 66 m., and Carmarthen is the chief town on its banks.

Towyn. Urban dist. and watering-place of Merionethshire, Wales. It stands on Cardigan Bay, 12 m. N. of Aberystwyth, and has a rly. station. The old inland village has been developed into a seaside resort with a broad esplanade, and there are facilities for boating and golf. The church has a nave dating from the 11th century. Pop. 3,802.

Toxicology (Gr. *toxikon*, poison). Science pertaining to poisons (q.v.) and poisoning.

Toxoid or ANATOXIN. Toxin or poison produced by germs, rendered harmless but still capable of immunising men and animals. Diphtheria toxoid is a solution of the products of growth of the diphtheria bacillus (*Corynebacterium diphtheria*) so modified as to be non-poisonous but able to induce immunity against the disease.

Toxophilite (Gr. *toxos*, bow; *philos*, loving). Lover of archery. The Royal Toxophilite Society was founded in 1781, and long had grounds situated in Regent's Park, London. Its headquarters are now at 1, Albion Mews, London, W.2.

Toy (Du. *tuig*, tool; *speeltuig*, toy). Plaything for children. Toys are older than civilized man, for archaeologists have unearthed prehistoric toys, of which the doll is symbolic as a personal possession suggesting for the child the adult life of its surroundings. The little girl, wishing to be like her mother, wants a doll and doll's house. Imitating his father, the small boy would be hunter, soldier, or craftsman; miniature weapons like sword and gun, drum and trumpet, tools, materials, and machines have been his playthings.

The importance of the toy in the development of the child mind has been recognized by educationists from Plato and Aristotle to Froebel and Montessori. The picture-alphabet, the box of coloured bricks, and other furniture of the contemporary kindergarten classroom, instil an appreciation of beauty and develop the constructive sense. The toy industry consults the child psychologist and the teacher as well as the artist.

The high-precision instruments used in mass-production of toys are surprisingly costly. Press-tools and jigs required to produce the prototype of a single design of toy motor car cost £16,000 in 1945. The tool needed for a tiny doll's-house chair in plastic cost £600. On the other hand, the simplicity of the home-made toy, created at small material cost, may leave nothing unsupplied to the child's pleasure. The Nursery School Association, London, has evolved instructional models for nursery school teachers from the most elementary materials: railway locomotives from cotton reels and empty tins, dolls from rags or scraps of brushwood, brightly coloured necklets from cherry and plum stones, trees from fir cones, even scooters and cradles from oddments of plywood.

Toys are indeed still made by hand in all parts of the world, often by children themselves in the classroom. But the toy-making industry is well organized and progressive, especially in the U.K. and the U.S.A. British toy exports in 1947 reached a value of £2,961,246. There are more than 400 important toy factories in the U.K., mostly in and around London, in the home counties, the Birmingham, North-

ampton, Liverpool, and Manchester districts, S. Wales, and N. Ireland. A British toymakers' association was founded in 1944. The number of insured persons registered as skilled workers in the trade in 1948 was 23,400—10,000 men and 13,400 women. Canada has also a flourishing industry, and good beginnings have been made in Australia and S. Africa. Some foreign countries tend to specialise in accordance with their natural resources. Sweden and Czechoslovakia, having ample timber, manufacture chiefly wooden toys. From France and Italy, centres of the silk and rayon industries, come beautifully dressed dolls. The U.K. excels in the creation of mechanical toys, especially models of limousines, trucks, locomotives, and ships, in all sizes, having displaced Germany whose mechanical toys (mainly from Nuremberg) before 1914 were sold throughout the world. See Doll. Leopold Spero

Toynbee, ARNOLD (1852-83). British social reformer. Born in London, Aug. 23, 1852, son of a distinguished surgeon, he was educated at Pembroke and Balliol Colleges, Oxford. Closely studying economics and sociology as well as religion and philosophy, he became a vital influence in the social movement of his time. He lectured to working class audiences in different parts of the country and associated himself with the Rev. Samuel Barnett (*q.v.*), then vicar of S. Jude's, Whitechapel, in work among the poor in the East End of London. A pioneer of personal service, he aimed at uniting all classes in one society. He died at Wimbledon, March 9, 1883. Consult his *Industrial Revolution in England*, with Memoir by B. Jowett, 7th ed. 1906; *Life*, F. C. Montague, 1889.

Toynbee, ARNOLD JOSEPH (b. 1889). British historian. A nephew of Arnold Toynbee (*v.s.*), he was born April 14, 1889, and educated at Winchester



A. J. Toynbee,
British historian

and Balliol College, Oxford, being fellow and tutor of his college during 1912-15. Later he held various govt. appointments, and was professor of Byzantine and modern Greek language, literature, and history at London university, 1919-24. In 1925 he became director of studies in the

royal institute of international affairs, and research professor of international history in London university. Toynbee wrote much on Greek and Turkish matters, but his reputation must rest on the massive *Study of History*, Vols. I-III, 1934, Vols. IV-VI, 1939; he published an abridged version of the work in 1946. His first wife was Rosalind, daughter of Gilbert Murray.

Toynbee Hall.

University settlement in London. Inspired by the work of and named after the elder Arnold Toynbee (*q.v.*), it was opened in Commercial Street, Whitechapel, with the Rev. S. A. Barnett as wardens, in 1884, the first institution of its kind in the world. It came into existence at a moment when public interest had been deeply

stirred by the writings on the London poor of Besant, G. R. Sims, Andrew Mearns, and others. Here university men, who went into residence in order to take part in social work, soon created a centre of popular education and recreation. Toynbee Hall was closely connected with the investigations of Charles Booth and Lord Beveridge (*q.v.*). Offshoots of Toynbee Hall are the Whitechapel art gallery, the John Benn hostel, the children's country holiday fund, the workers' educational association, the workers' travel association, and the children's theatre.

During the German air raids on London in the Second Great War Toynbee Hall organized concerts in the shelters and at the weekenders was thrown open to shelterers who wished to write or read or to enjoy good music.



Toy. Old and modern playthings of Europe and Asia. 1. Rag doll stuffed with papyrus, 3½ ins., Egypto-Roman, 3rd cent. B.C. 2. Mounted cavalier, 18 ins., German, early 17th cent. 3. Korean shadow-play figure. 4. Modern Indian toy on wheels. 5. Modern Chinese mechanical figure. 6. Bone guillotine, French, late 18th cent.

Although damaged, it accommodated some 1,500 evening students and had schools of drama, music, and painting. Its interests included reconstruction in E. London and the welfare of old age pensioners. See Settlement, Social.

Trabzon. Vilayet of Asiatic Turkey. It extends along the S. shore of the Black Sea from Vice in the E. to the Kizil Irmak in the W. It is mostly mountainous and heavily forested, but there are many fertile valleys and plateaux which produce good crops of wheat and barley. Timber is valuable; the mineral wealth is little developed. Formerly familiar as Trebizond, the vilayet has an area of 16,671 sq. m. and a pop. of 396,673.

Trabzon (anc. Trapezus). City of Turkey, capital of the vilayet of the same name. Situated on the Black Sea, 570 m. E. of Istanbul,

it is on a small plateau between two valleys. Its Byzantine walls still stand. Formerly a great commercial centre, its importance declined when a rly. was built from Batum to Baku, though Trabzon continued to export fruit, nuts, tobacco, hides, and skins. It was a Greek colony founded by Sinôpê; here Xenophon and the Ten Thousand reached the sea after their historic retreat. In A.D. 1204 it became the capital of the empire of Trebizond, under which name it was long known. The Turks took it in 1461. It was in Russian hands from 1916 to 1918. Its population was much reduced in 1895 by a massacre of Armenians. Pop. est. 50,000.

Trace Element. Any chemical element of which minute quantities are required for the healthy growth of plants and animals. If sheep are fed on pasture grown on soil which (as in parts of Australia) entirely lacks cobalt, they suffer from a deficiency disease known as pining (enzootic marasmus); the addition of as little as 0.08 to 0.1 parts in a million of cobalt to their fodder eliminates the symptoms. Similarly, manganese is a trace element for cereals and peas, boron for sugar beet, iodine and iron for humans.

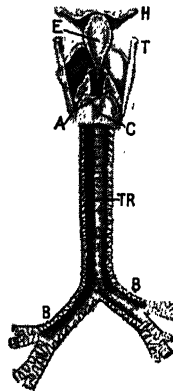
Tracer. Type of projectile containing a squib-like device that discharges smoke and sparks through its base to render visible its course of flight. Tracer shells are seldom larger than 40-mm. calibre, and their principal use is in anti-aircraft firing. Tracer bullets are used in air-to-air and ground-to-air firing at night, one being inserted in every fifth link of the ammunition belt. See *Bullet*.

Tracer Element. Any comparatively rare isotope used to follow the passage of an element or its compound through some biological (or other) process. Thus if radio-active carbon-14 is incorporated in organic molecules fed or injected into an animal its progressive distribution can be followed with geiger counters and photographic emulsions. Similarly nitrogen-13 can be used to trace the metabolism of proteins, sodium-24 of salt, etc. Where the tracer element is not radio-active (e.g. deuterium or oxygen-18) its detection requires more complicated methods of physical analysis. Tracer elements have also shown the spontaneous migration of individual nuclei through a metallic crystal lattice.

Tracery (Fr. *tracer*, to trace). In architecture, the ornamental

stonework of a Gothic window which followed the grouping of lancet windows in twos and threes under a single arch. The term is also applied to the corresponding decoration of a wood panel. The earliest form of tracery was known as plate tracery. In the 12th century this was a circle or quatrefoil introduced into the tympanum below the covering arch. Geometrical tracery possessed symmetrical forms such as trefoils, cinquefoils, quatrefoils, and circles. Flowing tracery followed, and late in the 14th century began to give way to the more vertical and stronger bars of the Perpendicular period, and with the Renaissance tracery disappeared. See *Architecture*; *Gothic Architecture*; *Perpendicular*.

Trachea or WINDPIPE. Nearly cylindrical tube which extends from the lower



border of the human larynx. It is about 4½ ins. long and ¾ in. in diameter, and terminates by dividing into the two bronchi. The trachea consists of a series of from 16 to 20 stiff cartilages in the form of a U. Behind it is the oesophagus or gullet. The word is Gr. fem. *trachea*, rough, an epithet applied to the *arteria*, windpipe, to distinguish it from the smooth arteries and veins which carry the blood.

Tracheotomy. Operation of opening the trachea in the neck to allow passage of air to the lungs when breathing is difficult or arrested by some obstruction in the air passages above the trachea. The operation is most frequently required in oedema of the larynx, with tumours, or when foreign bodies obstruct the air passages, but the development of anti-toxins has rendered it hardly ever necessary in diphtheria.

After the windpipe has been opened in the neck a metal tube is passed through to allow respiration.



Trachodon. Restoration of the extinct reptile which lived in N. America in the Cretaceous period
By courtesy of the American Museum of Natural History

Trachodon (Gr. *trachys*, rough; *odus*, tooth). Extinct fossil dinosaur found in the Upper Cretaceous deposits. It resembled an iguanodon (*q.v.*) in appearance, with a broad spatulate snout. Remains have been found in Wyoming and Montana.

Trachoma. Contagious disease of the conjunctiva or membrane covering the front of the eye and inner surface of the eyelids. See *Conjunctivitis*.

Trachonitis. Mountainous N. dist. of ancient Palestine. It extended from the Sea of Galilee N.E. towards Damascus, and from the time of the emperor Trajan formed part of the Roman prov. of Arabia.

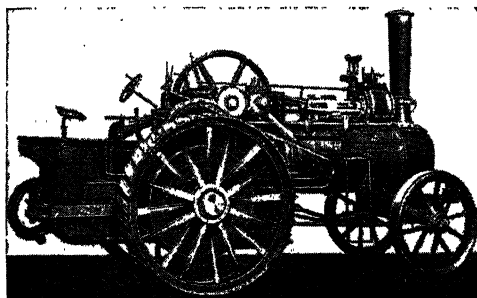
Trachyte. In geology, a type of lava with a chemical composition similar to syenite. It is mainly orthoclase and albite feldspar with small amounts of mica, amphibole, or pyroxene. Parallelism of the minerals due to flow and absence of quartz are characteristic. Potash and/or soda content of trachytes is usually high compared with other lavas having a similar percentage of silica. See *Igneous Rocks*.

Tract. Brief written treatise, generally of a hortatory or propagandist nature. The word is an abbreviation of the older form, *tractate*, from Latin *tractatus*, a treatise. It has come to be used more especially of short papers on religious themes published in the form of leaflets or pamphlets; but was formerly used of more important publications, e.g. Milton's *Tractate on Education*. Wycliffe wrote many vigorous tracts in support of his movement, and at the Reformation tracts were a favourite weapon of controversy

on both sides. The Puritans, from the Marprelate controversy (*q.v.*), were great tract-writers, and there is a large tract literature, religious and political, of the Civil War period. The Bangorian controversy (*q.v.*) produced many tracts. See Oxford Movement; Pamphlet.

Tractarianism. Alternative name for the Oxford Movement (*q.v.*). Its method of propaganda by means of a series of Tracts for the Times, 1833-41, gave its leaders and followers the name of Tractarians.

Traction Engine. Steam locomotive for hauling trailers along roads. This is the oldest type of mechanically propelled vehicle; the first was built in 1769 by Jules Cugnot, a French army officer, for towing guns.



Traction Engine. Steam-driven road locomotive, oldest road vehicle, and primarily used for hauling machinery and other heavy equipment
By courtesy of Ransomes, Ltd.

The engine had a speed of 2½ m.p.h., but was too unreliable for practical use, and eventually the boiler exploded, killing the inventor. In Great Britain, Murdock in 1782, Watt in 1784, and Symington in 1786 built steam traction engines, but the first actually to run was Trevithick's in 1803. This attained a speed of 9 m.p.h., but bad roads led to its being abandoned. In 1870 came the Aveling all-gear-driven traction engine, from which all later types developed.

The steam traction engine has a locomotive-type boiler with the engine mounted horizontally, and its cylinders at the smokebox end, and the side plates of the firebox shell extended upwards to carry the crank and gear shafts. Compounding, introduced by Foden in 1887, became standard. In all essentials the traction engine is similar to the locomotive, except that it runs on roads and its front wheels are steerable. Traction engines have been built weighing 20 tons and able to haul 70 tons. Too slow ordinarily for the road, they have been

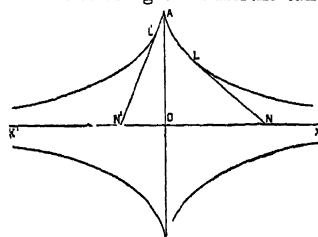
replaced to a large extent by the faster and more manoeuvrable tractor (*v.i.*). Their principal remaining uses are for hauling showmen's equipment and towing harvesting machinery. Agricultural traction engines have a driving mechanism for operating threshing machines.

Tractor. Mobile power unit used on roads for hauling trailers or on farms for drawing agricultural machinery. It is powered by an ignition internal combustion engine, a compression internal combustion engine (Diesel), or an electric motor. Tractors, as distinct from traction engines (*v.s.*), which are steam-driven, were introduced early in the 20th century; some have three or four wheels, others caterpillar tracks.

The wheeled tractor has a very short wheel base, while the rear wheels, to which the drive is transmitted, are large and originally had steel "spuds" on the outer circumference. When travelling on metal roads, the rear wheels were covered with steel hoops to prevent damage

to the roads. Nowadays the tendency is to fit heavy, ribbed pneumatic tires, which do not damage road surfaces and provide a good grip. The front wheels are smaller in diameter and steerable. Four-wheeled tractors do both road and farm work. On the road they can haul loads up to 50 tons, and on farms draw as many as a dozen ploughshares. Most farm tractors are fitted with a belt pulley, by means of which the vehicle can be used as a power plant to drive circular saws, threshing machines, pumps, and other stationary machinery. In Great Britain, the U.S.A., and the U.S.S.R., tractors are rapidly replacing horses for farm work. Smaller models are used on rly. platforms and in factories. Self-propelled excavators, bulldozers, cranes, and other heavy construction plant are tractors with special bodies; while another specialised type is the mechanical horse, used principally by rlys. to mechanise vehicles originally designed for horse traction. See Caterpillar Tractor; Farm illus. p. 3261; Ploughing; Tank.

Tractrix or **TRACTORY.** Curve invented by Huygens, in which the distances along the different tan-



Tractrix. $L'N'$, LN , are equal tangents from the curve to $X'OX$

gents from their points of contact to their intersections with a fixed line are all equal. The curve has four branches, and is asymptotic to the fixed line. It is the path described by a heavy particle pulled along by a flexible string moving along a straight line attached to a point which does not pass through the particle. The surface produced by revolving a tractrix about its asymptote has constant negative curvature and is called a pseudosphere.

Tract Societies. Associations for disseminating Christian teaching by the publication of tracts and cheap literature. The Society for Promoting Christian Knowledge, the first of the British tract societies, was followed in 1750 by the Society for Promoting Religious Knowledge, and the Religious Tract Society. See United Society for Christian Literature.

Tracy, SPENCER (b. 1900). American film actor. Born at Milwaukee, April 5, 1900, he was edu-



Spencer Tracy, American film actor

cated at Wisconsin university, and studied for the stage at the A.A.D.A. He first went on the New York stage in 1922 as a robot in R.U.R. In films from 1930, beginning with *Up the River*, he looked like becoming a comedian, but developed into an actor of rugged sincerity with a great following during 1936-39, especially after *Fury*, and *San Francisco*. As a Portuguese seaman in *Captains Courageous*, and a priest in *Boys Town*, his performances won academy awards. In *Stanley and Livingstone* he played another memorable rôle as Stanley, then turned mostly to social comedies. In 1949 he was in *Edward, My Son*.

Trade (O.E. *trædan*, to tread). Word used chiefly in two senses:

(a) a skilled craft, e.g. carpentry, plumbing, tailoring, learned gradually, often through apprenticeship, as a means of livelihood; and (b) the exchange of goods, buying and selling. In this second sense trade is a part of commerce, which includes also insurance, banking, transport, and other services ancillary to trade.

The history of trade and of trading is an important aspect of the history of civilization. Most improvements in communications and much geographical discovery have resulted from the desire to extend trade; and trading alone has made available the variety of commodities essential to any sort of civilization. In this respect, trade between different climatic regions has special interest.

Trade may be divided into (a) home trade (which includes wholesaling and retailing, i.e. shop-keeping), and (b) overseas trade (which includes, for the U.K., trade within the Commonwealth as well as trade with foreign countries). The U.K. relies on her overseas trade for much of her raw material and food, selling in exchange manufactured goods.

Volume of trade varies with the prosperity of communities. The recurrent boom and slump which characterised world trade after the industrial revolution is called the trade cycle; some economists believe that govt. planning can prevent this. See Balance of Trade; Barter; Exports; Imports; Free Trade; Protection.

Trade, BOARD OF. British govt. dept. responsible for advising on British home and export trade, observing trends in the production of raw materials and home-produced goods, and negotiating trade agreements within the Commonwealth and with foreign govts. The board of trade originated in a committee of the privy council set up in 1631 "to take into consideration the true causes of the decay of trade and scarcity of coyne within the kingdom." In 1650 the committee became a council of trade for the encouragement of industry and the care of "foreign plantations." The committee consisted of 70 members with a president, secretary, and two clerks. In the reign of Charles II, the council was made responsible for the rules relating to navigation and shipping; a function the board of trade continued to perform until a ministry of Shipping was set up in 1916 (absorbed later into the ministry of Transport). In 1696 the council received the title board

of trade. Abolished in 1782, it was revived two years later. In 1786, the archbishop of Canterbury was made a member of the board which, however, ceased to meet as a committee after the Napoleonic wars. The tradition of periodic meetings was kept up, but only the president and vice-president attended them. In 1853 the board's minute book was discontinued, and the vice-president ceased to exist, being replaced by a parl. secretary.

During the Second Great War, the scope and powers of the board of trade were greatly expanded and it exercised direct control over raw materials and manufactured goods. It became responsible for curtailing consumer production, fair distribution of the production allowed, and the diversion of raw materials to munitions. The board of trade issued licences for the purchase or export of controlled manufactures. The board was also responsible for the issue of clothing coupons.

The board of trade is the regulating body for the application of Acts of parliament as they affect industry, and deals with the Insurance and Companies War Damage Act, the Patent Act, and the Bankruptcy Act. It also deals with the policy and administration of British industry in respects not covered by the ministries of Supply, Air, and Civil Aviation. After the Second Great War, the board of trade was concerned with the re-conversion of industry to peacetime production, for home and export markets. See Board of Trade Journal.

Trade Bank. Bank founded specially to assist traders by making advances on the security of their stock and business prospects. It can usually lend money with greater freedom than do the ordinary banks, taking risks which are not permissible to the latter. See Banking.

Trade Board. Name of committees set up in the U.K. to fix wages in specified industries. Trade boards were established by an Act of 1909, in four trades specified in the Act, tailoring, box-making, lace-finishing, and chain-making, in which sweating (*q.v.*) was prevalent. In 1913 the Act was extended to include confectionery-making, food-preserving, shirt-making, hollow-ware-making (tin boxes, etc.), embroidery manufacture, and certain kinds of laundry work. An Act of 1918 empowered the minister of Labour to constitute a trade board in any industry where the minister "is of opinion that no adequate

machinery exists for the effective regulation of wages throughout the trade, and that accordingly having regard to the rate of wages prevailing in the trade or in part of the trade, it is expedient that the Act should apply to that trade."

The first Act was passed following agitation against sweated trades towards the end of the 19th cent., an inquiry by a select committee of the house of lords in 1890, the formation of the anti-sweating league in 1906, and a report by a select committee of the house of commons on home work. A trade board consisted of an equal number of employers and employed, with a small number of nominated members. Boards worked usually by districts. At first under the board of trade, in 1917 they were transferred to the ministry of Labour, by which the members were appointed. If many women employees were concerned, at least one of the appointed members must be a woman. A trade board (1) must fix a minimum rate or minimum rates for time work; and (2) might fix general minimum piece rates, special minimum piece rates, a guaranteed time rate, a piecework basic time rate. When fixing a rate, a trade board must advertise the rate in the London Gazette and, when appropriate, in the Edinburgh Gazette, and must notify every employer in the trade whose name and address were known. The employer must exhibit a copy of the notice in his works where employees might read it. Two months were allowed for objections. Where trade board minimum rates applied, appropriate records of the rates paid must be kept by the employer. Payment of the proper rates could be enforced by the courts. Agricultural wages boards, similar to the trade boards, were set up by the Agricultural Wages (Regulation) Acts of 1924 and 1940. The Road Haulage Wages Act of 1938 and the Catering Wages Act of 1943 both laid down legal procedure for the regulation of wages and working conditions. See Wages Council.

Trade Disputes Acts. British Acts of parliament. The first, passed in 1906, followed the Taff Vale Judgement (*q.v.*). It allowed peaceful picketing, and declared that trade union funds were not liable for damages.

A decision of the high court at the time of the general strike of 1926 held to be illegal "sympathetic" strikes by bodies of workers not directly concerned in a dispute. The Trade Disputes and Trade

Unions Act, 1927, passed to prevent another general strike, declared illegal any strike or lock-out which (1) had any object other than the furtherance of a trade dispute within the trade or industry in which the strikers were engaged, and (2) was designed to coerce the govt., either directly or by inflicting hardship upon the community. This Act was repealed by the Trade Disputes and Trade Unions Act, 1946, which declared that the law should be as if the 1927 Act had never been passed. *See* General Strike.

Trade Mark. Name or distinctive device used in relation to goods for the purpose of indicating a connexion in the course of trade between the goods and the person having the right to use the mark either as proprietor or registered user. A certification trade mark is a mark adapted to distinguish in the course of trade goods certified by any person in respect of origin, material, manufacture, quality, accuracy, or other characteristic.

In the U.K. a register of trade marks is kept at the patent office, London, and is divided into two parts. Part A marks must be either a name represented in some particular manner or a signature; or a word which must be either (a) invented, or (b) have no direct reference to the character or quality of the goods and must not be a geographical name or surname, or (c) be adapted to distinguish the goods; or some other distinctive mark adapted to distinguish the goods of the proprietor. Part B marks are required merely to be capable of distinguishing the goods. Marks registered in Part A are absolutely protected, but registration in Part B is only *prima facie* evidence that the person on the register has the exclusive right to use the mark. When an invented word has become so well known in respect of certain goods that use of it in connexion with other goods would indicate that they are made by the owner of the mark, the word may be registered as a defensive mark in respect of goods even though the owner of the mark has no intention of using the mark on these goods or of making those goods at all.

The law concerning trade marks in the U.K. is contained principally in the Trade Marks Acts of 1905 and 1919 and the Merchandise Marks Act, 1926.

Trade Name. Common term for a proprietary name applied to a particular product of a particular manufacturer which may not be

applied to any similar product made by another manufacturer. Examples are Bakelite, Cellophane, Dictaphone, Perspex, Technicolor. When such names are used elsewhere in this Encyclopedia they are enclosed in inverted commas.

Trades Council. Local permanent committee in the U.K. of delegates from various trade unions represented in a neighbourhood. Formation of these councils started in 1858, and by 1861 they existed in London, Glasgow, Sheffield, Liverpool, and Edinburgh; many of them started as strike committees. Their original object was to render advice or assistance to one another, in inter-union affairs as well as in disputes with employers; they came also to play a substantial part in promoting interest among trade unionists in local and national politics. The Trades Union Congress (*v.i.*) was called into being by trades councils.

Trades Union Congress. The voluntary association of British trade unions for the formulation of policy. National conferences of trade unions were summoned by the Glasgow trades council, 1864, and the Sheffield trades council, 1867; but the first trades union congress is counted as that summoned by the Manchester and Salford trades council in 1868, which represented 118,367 mem-

bers. In 1871 the congress was called in London to consider projected legislation that would have made criminal virtually any usual method of combination by workers; it elected a parl. committee to watch legislation and administration affecting labour, and to work for legislation recommended by the T.U.C., which thereafter met annually except in 1914. In 1923 the parl. committee was replaced by the general council, which was given power to act for the T.U.C. between meetings as well as simply to keep watch.

Membership in 1900 was 1½ m., in 1919 more than 5½ m., in 1930 3½ m., in 1946 more than 6½ m. with 187 affiliated unions. From 1893 the Socialist element became predominant in the congress. From 1894 trades councils were expelled from representation at its meetings, participation in which was thereafter confined to members of trade unions. The Scottish trades union congress, representing unions operating in Scotland only, was founded in 1897. Similar bodies have been created in many other countries. *See* American Federation of Labour; *Confédération Générale de Travail*; *Congress of Industrial Organizations*; *Trade Disputes Acts*; *Trades Council*. *Consult* The British Trades Union Congress, W. J. Davis, 1910-16.

TRADE UNIONS: ORIGIN & FUNCTIONS

Lord Citrine, Gen. Secretary T.U.C., 1926-46

The story of trade unions from their origins in England in the early 19th century is here told. See also Bevin, E.; Burns, John; Combination Laws; Hardie, J. K.; Mineworkers, National Union of; National Unions; Tillet, B.; Trade Disputes Acts; Trades Union Congress

Trade unions are permanent associations of workers formed for the purpose of maintaining and improving wages and salaries, reducing hours of work, and dealing with the general working conditions of members. Associations or combinations of workpeople with some of the characteristics of trade unions existed long before the industrial revolution in the latter part of the 18th century. But the regulation of wages and of the hours and conditions of employment could not legally be the subject of collective bargaining under the medieval system. Numerous Acts of parliament then in operation were avowedly designed to safeguard the interests of workers, and parliament resented any attempt to interfere by combined action. Combinations, whether of employers or workers, were forbidden, to preserve the

theoretical impartiality of the law, but the introduction of new methods of manufacture changed all that. The use of machinery, driven first by water power, then by steam, and involving considerable capital cost, transformed industries and trades hitherto conducted as domestic handicrafts. It ushered in the system of wage labour and factory production, separated the employers and the workers into distinct classes (capital and labour), and completed the breakdown of the existing legal system of labour regulation.

Some of the early trade unions originated in efforts to maintain the Tudor system, by which wages were subject to periodical assessments and fixed by justices of the peace, and terms of employment, apprenticeship arrangements, hours of labour, and other minor details

of industrial life were prescribed by legislation. The earliest anti-combination laws were directed against trade societies formed by the workpeople. Throughout the 18th cent. Acts of parliament multiplied, which made it a criminal offence for two or more workmen to combine to secure an increase of wages or any other change in the terms of their employment. Thirty-four Acts, dealing with the regulation of labour, and prohibiting combinations of working people, had been placed on the statute book in the course of several centuries. They were a powerful weapon against the wage earners' attempts to form trade unions throughout the 18th cent., during which both statesmen and employers tended to accept, in their crudest form, the teachings of contemporary economists who held that rates of wages must be determined by the supply and demand for labour in every industry and trade. This doctrine of freedom from legal or other restraint rested on the assumption that if every man was allowed to work out his own salvation without interference, all would be equitable in the end. It overlooked the defencelessness in competition of thousands of workers, thrown out of work by the new machinery, who were without any power to resist the conditions imposed by employers. This philosophy was current in the years that saw the destruction of the traditional defences of the wage earners, by the break up of the old trade guilds and of the Tudor system of wage-fixing by justices of the peace and state regulation of industry and trade.

Legalisation of Trade Unions

The injustice of leaving the workpeople unprotected by the state, and, at the same time, of denying them the protection of trade union organization, led in the first quarter of the 19th cent. to a strong agitation for the repeal of the combination laws, conducted by Francis Place and Radical members of parliament, assisted by leaders of trade unions. Their repeal, in 1824, marked the beginning of the trade union movement. Under section 2 of the 1824 Act it was provided that journeymen workmen or others who entered into any combination to increase wages, fix wage rates, alter working hrs., or change conditions of employment should not be made liable under any indictment or prosecution for conspiracy, or for any other

criminal proceedings or punishment whatever under the common or statute laws. Notwithstanding the 1824 Act, modified in the following year, the legal status of trade unions remained ambiguous, and much subsequent legislation was necessary to define their powers, functions, and responsibilities.

Trade unions are not the creation of Acts of parliament. What parliament did by enactments from 1824 onwards was to give unions legal recognition, and to attribute to them certain legal rights and duties. Some of these rights are enjoyed by no other bodies, as they relate specifically to the action of trade unions in the furtherance of trade disputes.

Consolidation and Affiliation

Trade union organization developed rapidly after 1824 among craftsmen and skilled operatives, in industries and trades brought into existence by science and invention. Unions grew stronger and more numerous, and then began the consolidation of smaller unions of craftsmen in national amalgamations, such as the amalgamated society of engineers, formed in 1851, the amalgamated society of carpenters and joiners, 1860, and societies in the printing, clothing, and textile trades.

Trade union organization spread among miners and workers in the iron, steel, and other heavy industries, in the rly. service and agriculture and among the so-called unskilled workers. Organization in these industries and services was stimulated by the activities of local federations of unions, called trades councils, and by the creation, in 1868, of the Trades Union Congress (q.v.). The growth of the trade union movement can be measured by the expansion of the T.U.C. and its influence in public affairs.

During the First Great War there was a threefold increase in the aggregate membership, reaching in 1920 rather more than 6½ m. in 215 affiliated unions. In the inter-war years, marked by severe industrial depression and widespread unemployment, trade union membership declined to just over 3½ m. in 1933. From then membership rose steadily until during the Second Great War it exceeded 6½ millions in 1945.

Some unions are not affiliated to the T.U.C. because they are ineligible; others, until the repeal in 1946 of the Trade Disputes Act of 1927, were legally debarred from membership. Some are

associations of employers, registered with, or certified by, the registrar of friendly societies as being trade unions. Annual returns compiled by the chief registrar of friendly societies showed in 1946 a total of rather more than 8,000,000 members in 946 trade unions. Many of these were small organizations; 531 had fewer than 500 members each. Sixteen unions, each with a membership of more than 100,000, account for three-fifths of the total membership of all unions.

Trade unions of workers, which were not formed on any preconceived plan, vary considerably. They cater for every class of worker, including not only manual workers of every grade, and skilled operatives and every category of craftsman, but also technicians, supervisory and administrative workers, professional workers, including artists and public entertainers, and members of the learned professions. From the historical standpoint the craft unions hold a foremost place, as the original trade societies which came into existence in the early days of the industrial revolution. Side by side with them are industrial unions which cater for every worker within the industry they purport to organize.

Principal Functions

Throughout their existence trade unions have performed two main functions: (1) collective bargaining in fixing wages, working hrs., and conditions of employment, and (2) provision of trade and friendly benefits, e.g. cash allowances to their members during periods of unemployment and sickness. As the unions developed their organization, they evolved broader conceptions of their functions, and although all unions do not function on identical lines, their activities have come to include, in addition to negotiation of wages, hrs., and conditions of labour and payment of benefits, (a) formulation of industrial policy; (b) recruitment of non-members; (c) general protection of members in their employment; (d) collection of contributions; (e) educational work; and (f) general service to members.

Collective bargaining often involves elaborate research, and may entail such work as the preparation of evidence for submission by the T.U.C. or by the unions to a royal commission or a govt. committee of inquiry. Industrial negotiations have been affected in method by the operation of con-

ciliation machinery such as joint industrial councils and arbitration tribunals. State machinery exists for the avoidance and settlement of trade disputes, established under the Industrial Courts Act, 1919, and earlier legislation, such as the Conciliation Act of 1896. Under this legislation the ministry of Labour and National Service is vested with power to intervene in trade disputes with a view to settlement by methods of conciliation, investigation, and, finally, voluntary arbitration.

To prevent stoppages in essential trades during the Second Great War the Condition of Employment and National Arbitration Orders, 1940-42, established a national arbitration tribunal as a result of a joint recommendation from the British employers' confederation and the T.U.C. to deal with disputes not settled by normal joint negotiation between employer and union. An employers' and a workers' panel were set up, one member selected from each with three permanent members constituting the tribunal, whose decisions were binding on both parties. Many awards were made by this tribunal. This was the first measure of compulsory arbitration to which the trade unions gave their assent.

The trade unions have always been somewhat chary of the regulation of wages and conditions by legal means, and the existence in many industries of joint statutory bodies whose function is to lay down minimum standards of wages and working conditions was necessitated by the weak organization in these trades and by the prevalence of low wages and "sweating" of the workers. (See Trade Board; Wages Council.)

Influence on Politics

The trade unions maintain relationships with both the political Labour movement and the Co-operative movement, through the national council of Labour, a joint composite body representing the T.U.C. general council, the national executive of the Labour party, the administrative committee of the parl. Labour party, and the Co-operative union.

The origins of the Labour party and the Co-operative movement are closely associated with the trade union movement, all deriving historically from the teaching of Robert Owen (*q.v.*). Owen, a philanthropic manufacturer, advocated the principles of cooperative industry, and sought to practise them in his own business. He inspired, after the repeal of the com-

bination laws, the establishment of a grandiose working-class organization called the grand national consolidated trade union which set out to unite all the unions in one national body. The Labour representation committee, founded 1900 in furtherance of a resolution adopted by the T.U.C., was the beginning of the parl. Labour party. The membership and financial resources of the Labour party are derived mainly from trade unionists, who contribute to a separate political fund of their unions.

Membership of Joint Bodies

In many ways, the unions act as part of the state's administrative machinery, and perform many advisory and consultative functions. In the administration of the state health and unemployment insurance, until the change brought into the system in 1948, trade union approved societies played a great part by assisting in collecting contributions of insured members and paying benefits. Most consultative and advisory relationships with govt. depts. and employers are the responsibility of the T.U.C. Joint bodies exist upon which the T.U.C. general council directly, and also, frequently, trade unions individually or in groups, are represented. It was, indeed, a direction from the coalition cabinet to all govt. depts. during the Second Great War that they must consult the T.U.C. and the unions concerned on all matters which primarily affected the workers. The T.U.C. is represented on dozens of joint bodies, many at cabinet level, dealing with *e.g.* industrial production, commodity price regulation, rly. rates, recruitment and distribution of nurses and midwives, export guarantees, overseas trade, colonial labour, medical questions, national savings, cinematograph films; and is associated with many cultural, health, welfare, recreational, and social institutions.

Trade union functions have been enlarged under the guidance of the T.U.C. in pursuit of a policy of accepting wider responsibilities, corresponding to the importance of the position the workers hold in the life of the country. This view of trade union responsibilities has led to closer association with the central bodies of employers, the federation of British industries, and the British employers' confederation. It has caused the T.U.C. also to play a leading part in the work of international bodies concerned with economic and in-

dustrial matters, *e.g.* the international labour organization of the League of Nations and the world federation of trade unions.

An old and socially valuable function of the trade unions, the provision of cash benefits for members in times of sickness, unemployment, old age, and death, continues to form a part of trade union work, notwithstanding the development of state social insurance. Unions render an essential service also to their members in dealing with claims for compensation, and most unions maintain legal officers to advise their members. Through the T.U.C., and through individual unions, too, a great deal of educational work is carried on through weekend and summer schools, and lecture courses in connexion with the London School of Economics and for residential students at Ruskin College, Oxford.

Trade Union, INTERNATIONAL ORGANIZATIONS OF. The international federation of trade unions, founded 1901 by representatives of the trade union movement from seven countries, including the U.K. had as its object the collection and exchange of information. By 1913, twenty national bodies with a membership of 8,000,000 were affiliated.

After the First Great War, the I.F.T.U. was reconstituted with h.q. in Berlin. Destruction of trade unionism in Italy (under Mussolini) and Germany (under Hitler), followed by the Second Great War, reduced its activities to nil. It dissolved itself Dec. 14, 1945, following the creation of the world federation of trade unions in Oct., 1945. Consultative status was conceded to the W.F.T.U. by the I.L.O. in 1948.

Differences between Communist and non-Communist groups within the W.F.T.U. arose over the attitude to be adopted to the European Recovery Programme (*q.v.* in N.V.), and in Jan., 1949, the British T.U.C., the U.S. congress of industrial organizations, and the Dutch federation of trade unions withdrew from membership, followed by the trade union bodies of Australia, Norway, New Zealand, Belgium, Switzerland, Sweden, Iceland, and Luxemburg. On Dec. 7, 1949, representatives of more than 46,000,000 workers in 53 non-Communist countries set up the international confederation of free trade unions, with h.q. in Brussels. In March, 1950, U.N.E.S.C.O. and the I.L.O. gave this body consultative status.

Trade Wind. Name given to the persistent winds which represent the circulation of air at the E. and equatorial sides of the great permanent anticyclones of sub-tropical regions. Trade winds blow inwards, from the N.E. in the N. hemisphere and from the S.E. in the S. hemisphere, towards the equatorial belt. The term originated in the nautical phrase to blow trade, *i.e.* to blow in a regular track or with constant direction. Regularity or constancy are their marked characteristics; their discovery is usually credited to Columbus. The trade winds were of great importance to the sailing ship, and, in the 19th cent., Maury's investigations, by means of data collected by ships, resulted in a considerable saving in time in many oceanic passages.

The trade wind belts extend over 1,000–1,500 m. of lat. both N. and S. of the equator, with the exception of the N. Indian Ocean, which is subject to the monsoon (*q.v.*). With the doldrums they move N. and S., over about 5° of lat. following, with some lag, seasonal changes in the sun's declination. Although remarkable for their steadiness, particularly in the Atlantic, they are not perfectly so, day-to-day variations being dependent upon the position and intensity of the oceanic anticyclones. The average speed of the N.E. and S.E. Atlantic trades is 9.4 m.p.h. and 12.6 m.p.h. respectively. In both hemispheres the trades are strongest in spring, *i.e.* April on the N. and Sept. in the S.

Since the trade winds transfer air from higher to lower lats., the accompanying weather is brisk and invigorating, and the sky generally almost cloudless. Off cold-water coasts in the S.E. belts, *e.g.* S.W. Africa, Chile, Peru, California, foggy conditions are frequent, the fog being carried landwards by the locally deflected winds. At higher levels the trade wind undergoes a complete reversal in direction, then being called the anti-trade. Upper air observations suggest that the height at which the reversal takes place varies with season and lat. See Map; Rainfall; Wind.

Trading Estate. Name given to sites bought by the British govt. under the Special Areas Act, 1934, and the Distribution of Industry Act, 1945, in the so-called development areas. On these estates, which were run by govt. financed cos., private firms were encouraged to set up light

industries new to the neighbourhoods. The original development areas, N.E. England, S. Wales, and Scotland, had been primarily heavy industry districts where unemployment was severe between the two Great Wars; in Cumberland, added later, war industry developed during the Second Great War had to be replaced. Wrexham, N. Wales, and St. Helens and Wigan, Lancs, were brought into the scheme in 1946. Some royal ordnance factories were among works taken over as trading estates after the Second Great War. The estates, planned to give employment to more than 100,000 workers, were well supported by industrialists. See Depressed Areas.

Trading with the Enemy. This subject is covered under the heading Enemy.

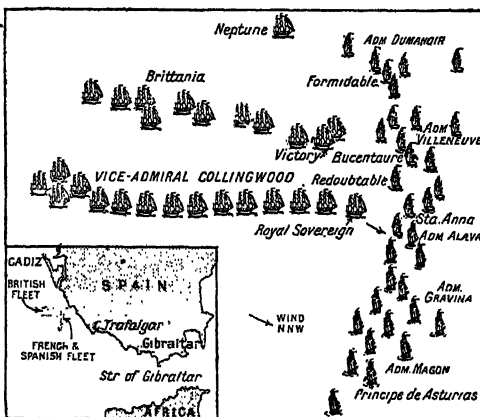
Traducianism (Lat. *traducere*, to bring across). In theology, the doctrine that the soul of a child is produced by the soul of the parents as an act of natural generation. The opposite doctrine is creationism, according to which a soul is created by God for every human being immediately at birth.

Trafalgar, BATTLE OF. Fought on Oct. 21, 1805, between the British and the combined French

rangements previously made with his officers, divided his force into two columns which he proposed to drive at different points through the enemy's line. This manoeuvre, though foreseen by Villeneuve, was successfully carried out. Collingwood, leading the lee (or starboard) line of 15 ships in the Royal Sovereign, broke through ahead of the 15th ship from the enemy's rear, while Nelson, leading the weather-line in the Victory, made a second breach immediately astern of the Bucentaure, the hostile flagship, after feinting as if to engage the van. The Victory had made the signal to prepare for battle at 6.22 a.m., but it was noon before the first shot was fired. The Bucentaure opened on the Victory at a range of 1½ m., but no answer was returned until the latter was passing under and within 30 ft. of the French ship's stern, when every gun on the broadside, double or treble shotted, was discharged as it came to bear. In this single broadside 400 of the enemy were killed or wounded. By 1.30 the action was at its height, scattered groups of ships being fiercely engaged down the whole line. A few minutes before this Nelson received his mortal

wound, from a musket-shot fired from the main-top of the Redoubtable. By 3 o'clock the issue was decided, and the French and Spanish ships that were in a condition to do so were endeavouring to make their escape. Two hours later the fighting ceased.

Fifteen enemy ships were taken or destroyed, and of the 18 that got away two were wrecked on Oct. 24 and four taken by Sir R. Strachan



Trafalgar. Sketch depicting Nelson's plan for driving his force through the combined enemy fleets at two points
Courtesy of The Daily Telegraph

and Spanish fleets off Cape Trafalgar, which is a low headland in Cadiz prov., Spain, about 30 m. N.W. of the Strait of Gibraltar. The British fleet under Nelson consisted of 27 ships of the line mounting 2,138 guns, and was opposed to a Franco-Spanish force of 33 sail, with 2,640 guns, commanded by Villeneuve.

The enemy was sighted in the early morning, steering due N. in a confused line ahead formation, and Nelson, in accordance with ar-

on Nov. 3. No British ships were lost, and the casualties were only 449 killed and 1,242 wounded. Tactically Nelson's masterpiece, Trafalgar is one of the world's decisive naval actions, as it ended Napoleon's threat of invasion. Consult The Campaign of Trafalgar, J. S. Corbett, 1910.

Trafalgar Estates Act. Passed by the British parliament in 1947 to put an end to the perpetual annuity of £5,000 granted by parliament in 1806 to the

Rev. William Nelson (brother of Lord Nelson) and his descendants in recognition of Nelson's victory at Trafalgar.

Trafalgar Square. London open space on the N. side of Charing Cross. A memorial of Nelson's last victory, it was begun in 1829 and completed 1867, modified from designs by Sir Charles Barry. Its central feature is the Nelson Column, 145 ft., by W. Railton, surmounted by a statue, 18 ft., by E. H. Bailey, with bas-reliefs of Nelson's battles at the base, by Woodington, Carew, Ternouth, and Watson, and four couchant bronze lions by Landseer. Artesian wells supply fountains, which, with busts on the N. wall, form a memorial to Jellicoe and Beatty. There are statues of George IV, Havelock, and Sir C. Napier. On the N. terrace wall are official standards of length; at the S.E. corner is an entrance to the Bakerloo tube rly. Scene of many historic and popular demonstrations, the square occupies part of the site of the village of Charing. Here were the royal mews of Chaucer's day, and later the rookery called Porridge Island. The highway surrounding the square is a traffic roundabout. See Charing Cross; Column; London; National Gallery; S. Martin-in-the-Fields.

Traffic Signals. Devices for controlling the movement of road vehicles and pedestrians. Traffic signals are either temporary or permanent. The former include diversionary notices; warning signals, oil or electric red lamps to mark temporary obstructions; or manually operated colour-light signals to control traffic along roads under repair. Among types of permanent traffic signals are illuminated road beacons, usually set on islands, with the object of keeping vehicles in a line; unlit signals of the Belisha beacon type; studs to mark pedestrian crossings; central lines or studs to divide traffic lanes; and electrically operated automatic signals to control vehicle and pedestrian traffic at busy corners and cross-roads.

Colour-light signalling was introduced in 1918, when congestion on Fifth Avenue, New York, became too acute for point-duty policemen. A series of signal towers was placed down the centre of the street, each carrying red, green, and white electric lights operated by hand. These were replaced by two-colour automatic lights on posts at street corners, controlled by time switches.

The first traffic lights in England were put up at Leeds in 1923; the first in London at the junction of St. James's Street and Piccadilly in 1926. These were originally manually, but later automatically, operated. Whereas the lights in the U.S.A. and France have a two-colour phase, red and green, those in British Commonwealth countries work on a cycle of four light changes: red (stop); red and amber simultaneously (prepare to start but do not move); green (go straight ahead, or to left or right); amber (prepare to stop). The length of the total light cycle varies between the limits of 30 and 120 secs.

There are four principal systems of time-operated colour-lights; synchronous, red overlap, limited progressive, and flexible progressive. All have a predetermined cycle of operation, the switching on and off of lights being governed by a clock. Synchronous lights show the same colour at any one moment at all intersections along the whole street, so that all change at once. The red overlap system allows traffic from a main road into a side street with the minimum disturbance to through traffic. Limited progressive lights are so timed at each road intersection that alternate lights are synchronous. In the flexible progressive system, signals change according to the irregular spacing of street crossings and volume of cross traffic.

The cycle of light changes is often controlled as required by the vehicles themselves passing over detector pads surfaced with rubber, the pads being in pneumatic or electrical contact with a control box. When the lights have been altered by a vehicle, they remain at the colour shown for a predetermined period. Vehicle-operated lights are usually installed where traffic is irregular.

Most automatic traffic light systems incorporate an additional green light, called a filter, which permits vehicles to turn off into side streets while the red light remains against the through stream. At some pedestrian crossings, manually operated lights allow pedestrians to halt traffic for a limited period governed by a time switch. Experiments have also been made with lights operated by vehicles interrupting the beam from a photo-electric cell. See Signals colour plate.

Trafford Park. District of Manchester. It is about 2 m. W. of the city proper, with a rly.

station. The hall here was long the seat of the De Trafford family. Bordering the Manchester Ship Canal, the estate was purchased by a company and cut up into sites for warehouses and factories, and works have been erected here. See Manchester; Manchester Ship Canal; Old Trafford.

Tragacanth. Gum-like exudation obtained by incision of a species of the shrub *Astragalus*, found native in Asia Minor. It occurs in thin, white or yellowish flakes, and is used in medicine as a demulcent, and as a means of temporarily suspending insoluble powders in mixtures. See Gum.

Tragedy (Gr. *tragos*, goat; *ōdē*, song). Originally a hymn or choral ode sung at the festival held in honour of Dionysus among the ancient Greeks. The reason for the appellation remains uncertain. The most plausible explanation is that a goat, the destroyer of vines, was sacrificed to the wine god during the singing of the ode.

As defined by Aristotle, tragedy is a representation of an action that is weighty, complete, and of a due magnitude, effecting through pity and terror a purgation of the like passions in the mind of the spectators; and Professor Tyrrell explains this purgation as broadly indicating that the feelings should be rightly excited about something which is their proper object, and that those feelings should ultimately be allayed artistically. Modern tragic art too often neglects the due allaying of the passions aroused, leaving the spectator as it were isolated upon a peak where no voice of hope or comfort can reach him, and appalled with the immensity of the tragic situation.

It was otherwise with Greek tragedy, which, while telling the old story of sin and suffering, and showing men ever in the hands of chance and fate, yet taught that God is good. Behind the inexorable destiny it never failed to see the cosmic order and the divine justice of man's incurring penalty for failure in or breach of that duty which preserves the very stars from wrong.

Tragedy, according to George Eliot, consists in the terrible difficulty of the adjustment of our individual needs to the dire necessities of our lot, partly as to our natural constitution, partly as sharers of life with our fellow-beings. A good tragic subject, she declares, must represent a possible, sufficiently probable, not a common action; and to be really



Tragopan. The Horned Pheasant, *Pucrasis satyrus*, native of the central and eastern Himalayas

tragic, it must represent irreparable collision between the individual, with whom we sympathise, and the general, of which we recognize the irresistible power; the tragedy consisting in the struggle involved, and often in the entirely calamitous issue in spite of a grand submission.

To the criticism that it is almost a mockery to tell an individual crushed by such a collision to seek his own happiness, since the nearest approach to well-being that can be made in such a case is through large resignation and acceptance of the inevitable, George Eliot replies that that is not all that is left. Love, pity, constituting sympathy, and generous joy with regard to the lot of our fellow men, come in, enormously enhanced by wider vision of results, and by an imagination actively interested in the lot of mankind generally; and these feelings become piety—i.e. loving, willing submission, and heroic Promethean effort towards high possibilities, which may result from our individual life.

So she arrives at the purgation insisted on by Aristotle as an essential of tragedy. Man cannot be utterly blind to the results of duty, since that cannot be duty which is not already judged to be for human good. To maintain the contrary is to say that mankind have reached no inductions as to what is for their good or evil. The art which leaves the soul in despair is laming to the soul, and is denounced by the healthy sentiment of an active community. Consolation is to be found in conviction of the importance of individual deeds and of the all-sufficiency of the soul's passions in determining sympathetic action. See Comedy; Drama; consult also *The Tragic Drama of the Greeks*, A. E. Haigh, 1896; *The Idea of Tragedy*, W. L. Courtney, 1900; *Tragedy*, A. H. Thorndike, 1908; *The Language of Tragedy*, M. E. Prior, 1947.

Tragopan OR HORNED PHEASANT (*Pucrasis*). Genus of game birds. They include five species, found only in the Indian sub-continent and China, and are famed for the brilliance and beauty of their plumage. They occur in bamboo plantations and in dense coverts on the hills. The males indulge in elaborate displays in the breeding season.

Traherne, THOMAS (c. 1637–74). English mystic poet and prose writer. The son of a Hereford shoemaker, he was educated at Brasenose College, Oxford, and in 1657 became rector of Credenhill, near Hereford, and afterwards chaplain at Teddington to Sir Orlando Bridgeman, lord keeper of the seals. Traherne died Sept. 27, 1674. He left two MSS., one of mystical poems, the other comprising four prose Centuries of Meditations, each in 100 paragraphs. Both MSS. were discovered on a bookstall and edited and published by Bertram Dobell, in 1903 and 1908 respectively.

Of the school of Herbert and Vaughan, Traherne is raised to ecstasy by considering the influence of natural beauty on character; but he has more than either of sheer joy in existence, while he is equally devout. Some passages in the third of the Centuries, notably the one beginning "The corn was orient and immortal wheat," have never been surpassed for magnificence of style. A biography by G. Wade appeared in 1945.

Traill. Town of British Columbia, Canada. On the Columbia river, it is 48 m. S.W. of Nelson on the C.P.R. Less than 2 m. away is Tadanac, home of the largest non-ferrous metallurgical plant in the British Commonwealth; also of a fertiliser factory. Pop. 9,392.

Traill, HENRY DUFF (1842–1900). British author and journalist. Born at Blackheath, Aug. 14,



Henry D. Traill, British author

1842, the son of a barrister, he was educated at Merchant Taylors' school and St. John's College, Oxford. He became a barrister and in 1871 a civil servant, but also gave time to journalism. A contributor to many daily and weekly journals, he became in 1897 the editor of *Literature*. His books include *The New Lucian*, 1884, two volumes of *Essays*; and, among

biographies, *Sterne*, 1882; *William III*, 1888; *Strafford*, 1889; *Salisbury*, 1891; *Franklin*, 1896; and *Cromer*, 1897. Traill died in London, Feb. 21, 1900.

Traill, WILLIAM ACHESON (1844–1933). An Irish engineer. After working with the geological survey, he produced a scheme for a hydro-electric tramway at the Giant's Causeway, Antrim. There was considerable opposition, but the scheme was eventually adopted, the tramway being opened Sept. 3, 1883, the first of its kind in the world. Traill died July 6, 1933.

Train Bands. Bodies of English citizen soldiers. They were first constituted in the reign of James I, partly on the old fyrd system, partly on a voluntary basis. They took a prominent part on the parliamentary side in the Civil War, and in consequence were abolished by Charles II after the Restoration. See *Fyrd*; *Militia*.

Train Ferry. Service of vessels specially constructed for the transport of railway trains across water. Such vessels are known as train ferry ships or boats. The advantages of such a service are the great saving of time, labour, and expense effected by running the trains on board and off again and so avoiding the necessity of discharging their freight, and loading it on to an ordinary vessel, and reversing the process at the end of the voyage. Some ferry ships are designed to transport rly. cars only, the locomotive being left behind and replaced by another on the other side. By others locomotives are also transported.

Training College. Institution at which teachers are trained; also called a normal school. Such colleges are of many types: (a) for men, for women, for both sexes; (b) for those of one religious faith only; (c) for training teachers to work with certain types of pupil, e.g. infants, the blind, the deaf; or to work in certain kinds of school, e.g. technical. Some, such as Borough Road (Isleworth) and St. Mark and St. John (Chelsea), were established in the mid-19th cent. by religious societies to staff their elementary schools. Emergency training colleges (more than 50 in 1948) were set up by the ministry of Education and local education authorities as a consequence of the Education Act, 1944. At the permanent colleges (more than 80 in 1948) the ordinary course takes two years, usually with a possibility of an additional year

to enable a candidate to sit for a university degree. Most students at emergency colleges follow a one-year course with two years of supervised study during a probationary period of practical teaching. Training teachers is an important function of English universities. *See* Education; Froebel System; Teaching.

Training Ship. British ship employed in training youths for the royal and merchant navies. There are several of these at different ports of the U.K., e.g. Devonport (*q.v.*), Greenhithe. Naval cadets have a period in a training cruiser before going to the fleet as midshipmen. *See* Britannia.

Trajan (A.D. 53-117). Roman emperor, 98-117. Marcus Ulpius Trajanus, a Spaniard of Italica, near Seville, was born Sept. 18, 53. He achieved rapid distinction in the Roman armies in Spain and Syria, and was in command of forces on the Rhine when the emperor Nerva wisely selected him as his colleague and successor, and with that end in view formally adopted him in 97. On Nerva's death Trajan became emperor. His high character and great military talents were matched by his administrative ability; at no period was the government of the Roman empire and its provinces better conducted.

Although a mistaken conception of the political meaning of the Christian faith led him to sanction measures for its repression, the almost universal praise of the great emperor was hardly qualified except by the historians of the persecuted sect; and Trajan himself forbade any hunting down of Christians, only requiring that those who were persistently defiant should be punished. He was the first emperor who deliberately set himself to extend the Roman dominion, and during 101-105 he thoroughly subjugated the trans-Danubian territory of Dacia, which corresponds roughly to the modern Rumania. Later he led an expedition to the east for the subjection of Armenia and in the hope of extending the bounds of the empire by further conquests beyond the Euphrates; but after taking the Parthian capital Ctesiphon in 115 he was forced to retreat, and the Jews in the eastern

provinces rose in revolt. Trajan died Aug. 8, 117, at Selinus in Cilicia, and his policy of expansion was at once reversed by his successor Hadrian. Trajan's deeds were commemorated on the celebrated pillar in Rome. *See* Hadrian; Rome.

Trajectory. Term applied in ballistics, and especially in gunnery, to the curve described by a projectile during its passage from the muzzle to the first point of impact. Theoretically this curve should be a parabola, but in practice a number of forces change the course of the projectile. The principal of these are varying densities of the strata of the air, and force and direction of wind. The study and consequent calculation of the effect of these factors is part of the theory of ballistics (*q.v.*). *See* Guns; Howitzer.

Tralee. Seaport, co. town, and market town of Kerry, Eire. It stands near the mouth of the river Lee, on Tralee Bay, with which it is also connected by a ship canal. Tralee is a station and junction on the Eire state rlys., 21 m. N.W. of Killarney, and a narrow gauge rly. runs to Dingle. The trade consists chiefly in exporting butter and grain, and importing coal and timber. The scenery in the neighbourhood is remarkably fine, and there are interesting historical remains, including the cathedral of Ardfert and a round tower at Rattoo. The town grew up round a monastery and had a castle. It became a corporate town after 1603, and until 1800 sent two members to the Irish parliament. It was represented separately in the parliament of the U.K. 1832-85. For local govt. it has an urban dist. council. Pop. 10,285. Tralee Bay, an opening of the Atlantic, is about 6 m. wide at the entrance, and has a length of 12 m.

Tramecourt. Town and wood of France. In the dept. of Pas-de-Calais, the town is 16 m. E. of Montreuil, and slightly S.E. of Fruges. Near Agincourt, the wood was prominent in that battle, the duke of York's right wing resting on it. To the N. of the wood is a cemetery, where 5,800 French are said to have been interred. *See* Agincourt.

Trammel Net. A kind of fishing net. It consists of three nets, fixed to stand upright in the water parallel to each other. The innermost of the three is twice the length and twice the height of the outer two, and is of a smaller mesh. Fish swimming through the larger

meshes carry with them a fold of the inner net, and thus become enclosed in a pocket from which escape is impossible. This net is usually worked by putting it down towards evening off a rocky coast, and taking it up on the following morning. Among the fish usually caught in the trammel net are red mullet and bass. *See* Fisheries.

Tramp. Literally, something that is trodden. It has come to be used for a homeless person who walks from place to place, and for a walk. Another tramp is a plate of iron worn by diggers under the hollow of the foot to save the sole. A tramp steamer is one that makes short voyages from one port to another, carrying such casual cargo as can be obtained. *See* Vagrancy.

Tramway. Means of transport in which vehicles run on rails laid on public roads. Tramways developed directly from the rails laid around coal mines towards the end of the 18th cent. to enable the horse-drawn loads of coal to be increased. The system of horse-drawn cars on rails was first adapted for passenger transport in New York in 1832. Passenger horse-trams first appeared in the U.K. in the 1860s. Steam-driven tramcars were first introduced at Birmingham in the 1880s, and were seen in some other English cities and towns. The steam engine was a separate unit, the passenger car being a trailer. Dirty both for travellers and for the general public using the streets, they were soon superseded by electric trams, though they were still to be seen in some British towns in 1905, and in Paris as late as 1913.

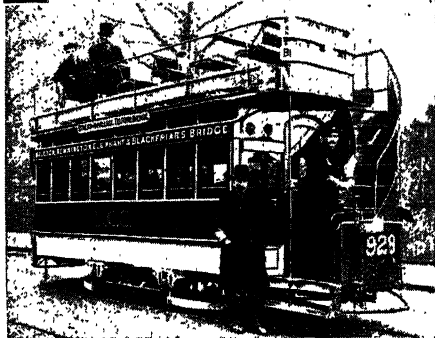
Electric trams were known in Germany in the 1880s, and the first line in the U.K. was opened at Blackpool, 1885; the first overhead system at Leeds, 1891. In the first quarter of the 20th cent. electric tramways were in evidence in all populous urban communities, and formed an exceedingly popular mode of transport. In 1925 over 14,000 trams were running in Great Britain. By 1947 this figure had fallen to below 8,000, and the peak figure of 2,700 route miles of track (1920) to 1,000 m. in 1947. With the increase of motoring, tram tracks themselves, as well as the restricted movement they imposed on the trams, became recognized as a nuisance, and at times a danger. The greater mobility of the motor bus and trolley bus made them more serviceable (as well as more comfortable) vehicles of public transport in all but the most



Trajan,
Roman emperor



Tramway. The first London trams passing Marble Arch, from a print of 1861. Left, a London County Council cable tramcar on Streatham Hill, 1900



densely populated centres. Also the relaying of track, necessary every few years, was expensive; and the unsightliness of the overhead trolley equipment contributed to the decline of the tram's popularity.

On the other hand, neither motor bus nor trolley bus can cope as adequately as the tram with the heavy passenger traffic in large towns and cities, on main routes to and from the industrial and commercial centre. Although by 1939 Bristol had scrapped its admittedly old-fashioned tramways, and they had almost disappeared from the London area N. of the Thames, it was still found in such centres as Birmingham, Manchester, Sheffield, Leeds, Edinburgh, and Glasgow—as in S. London—that trams remained the most economical means of carrying heavy loads of workers, especially if the tram service was adequately supplemented by motor buses. Manchester, however, scrapped its trams in 1949, and S. London began to do the same in 1950.

The three main methods of propelling tramways are by underground cable, by underground electric conduit, and (the most usual) by overhead trolley in contact with conductor wires. In all these methods the power is transmitted from a central power station,

the slot, to grip or release the cable as required by the driver. The underground electric conduit system also necessitates a roadway slot, and the tram carries a sliding contactor. In the overhead system the tram makes contact with the overhead conductor wires either by a trolley, attached by a springy boom or pole to the top of the vehicle, and running along the underside of the wires, or by a collector bow. The overhead wires have to be supported at intervals of about 50 yds. (at closer intervals when rounding curves), usually by steel poles sunk 5 or 6 ft. into the ground. The round copper wires are supported by long "ears" to which their upper halves are soldered. The electric current returns through the rails.

The tramcars themselves have two types of chassis, or truck: the single truck with four wheels, and the bogie with a four-wheeled swivelling truck at each end. There are two motors, each of which drives one pair of wheels through reduction gear. The motors are carried on frames hinged at one end to the car axle, while the other rests upon springs. The h.p. of tramcars ranges up to 50. The cars are almost always arranged to run either way, the control apparatus being duplicated

at either end of the car. The apparatus consists of electric controller, handbrake, and emergency brake. The controller turns the current on and off, varies the pressure passing to the motors, and reverses direction. It has two handles, one for stopping and starting, the other for reversing. The usual form of emergency braking is by shoe brakes close to the rails, controlled by either hand gear, compressed air, or magnetic attraction. For ordinary stops, brake-shoes are fitted to the wheels.

Tram rails are rolled from best steel in lengths up to 60 ft. They are laid in a bed of concrete at least 6 ins. deep, the two rails being connected by crossbars at intervals, while the road between them is made up level with granite setts or wood blocks laid in cement or pitch. The rail joints are usually welded. The gauge varies from 3 ft. 6 ins. to 4 ft. 8½ ins. See *Electric Traction* and illus. p. 3001; also *Bogie* illus.

Trance. Condition of insensibility resembling sleep, from which, however, the individual cannot be roused, and which is not due to disease or injury of the brain. When associated with rigidity of the muscles, the term *cataplexy* (*q.v.*) is employed. Trance is a rare condition and probably most often arises from hysteria; though it can be induced hypnotically. It has been said that the condition may be mistaken for death, but the retention of bodily warmth and evidences of continuing circulation and respiration make a correct diagnosis possible.

Tranent. Police burgh and parish of E. Lothian, Scotland. It is 10 m. E. of Edinburgh, on the main road to Dunbar, with a rly. station, and is in the centre

of a colliery district which gives employment to the town. The parish church contains interesting monuments. The ruins of Waterfa'side Castle are in the neighbourhood. Pop. 4,526.

Trani (anc. Turenun). Coast town of S.E. Italy on the Adriatic Sea. It is in the prov. and 25 m. by rly. W.N.W. of Bari. The 12th century cathedral has a notably high tower, famous bronze doors, and one of the largest crypts in the world. The Normans took the place, then a busy seaport, in 1073, and during the Crusades trade increased. The harbour is now filled up, but there is trade in wine, olive oil, nuts, and figs.

Tranquebar. Harbour of Madras state, India, on the Coromandel coast, in Tanjore dist. It was formerly a Danish settlement on the sea front of the Cauvery delta. The English church was built by the Danes in 1620 and the New Jerusalem church in 1717. Tranquebar was sold to the English E. India co. in 1845. Pop. 19,000.

Transandine Railway. S. American railway. It gives communication between the rlys. of Argentina and those on the W. slope of the Andes. Finished in 1910, it runs from Mendoza, 2,520 ft. above sea level and 651 m. W.N.W. of Buenos Aires, to Santa Rosa de los Andes, 2,723 ft. above the sea and about 90 m. E.N.E. of Valparaiso, its length being 155 m. At its highest point under the Uspallata Pass it attains an elevation of 10,521 ft., about 6,700 ft. higher than the St. Gotthard. It is on the metre gauge, though the rlys. it connects are of 5 ft. 6 ins. gauge. Owing to the steepness of the gradients the Abt rack system had to be adopted for a total length of nearly 22 m.—seven sections on the Argentine side, and six on the Chilean. Nine tunnels are in Argentine territory, and 26 in Chilean, the summit tunnel, 3,463½ yards, being divided between the two countries.

In 1948 another Transandine line was completed, a project carried out jointly by the two countries, between Salta in Argentina and Antofagasta in Chile.

Transcarpathian Ukraine. Name applied to Ruthenia (q.v.) after its absorption by Ukraine (q.v.) S.S.R. See also Carpatho-Ukraine.

Transcaucasia. Region lying S. of the Caucasus Mts. It is sometimes included within the continent of Europe, but is more

precisely regarded as the N.E. of Asia Minor. In 1922 there was established the Transcaucasian S.F.S.R., a union of the republics of Armenia, Azerbaijan and Georgia. In 1936 each of these three was raised to the status of a constituent republic of the U.S.S.R. See separate entries.

Transcendental (Lat. *transcendere*, to overstep). Philosophical term used by the Schoolmen to denote a concept of wider application than the Aristotelian categories. The form transcendent was also used. Kant, however, distinguished them, applying "transcendent" to that which is connected with matters entirely beyond experience; "transcendental" to the principles of the pure understanding, the *a priori* and necessary conditions of experience. That which is transcendent goes for him beyond empiricism, but is not transcendent, i.e. does not pass the bounds of human knowledge.

Transcendentalism. Name applied to any philosophical system which recognizes *a priori* conditions of experience. It is specially associated with a movement in New England about 1830–50, led by Emerson, Ripley, Alcott, etc. Insisting on the dominance of intuition over reason, it was vaguely inspired by German idealism. A revolt against American Puritanism, it developed theologically into Unitarianism and mysticism, and socially and economically into Socialism, while strengthening the anti-slavery movement and literary romanticism. See Brook Farm; Emerson.

Transcona. Town of Manitoba, Canada, 6 m. E. of Winnipeg, on the C.P.R. and C.N.R. The railway shops of the latter are located here; also a creosoting plant. Pop. 5,495.

Transcription (Lat. *trans*, across; *scribere*, to write). Act of transferring writing from one book to another. The writing thus transferred is called a transcript. In music, transcription is the arrangement of a piece of music in a manner different from its original form, often with additional points of treatment, as in Liszt's piano transcriptions of some of Schubert's songs. The word is also used for longhand copies from shorthand notes, and for records of broadcast programmes translated into other languages.

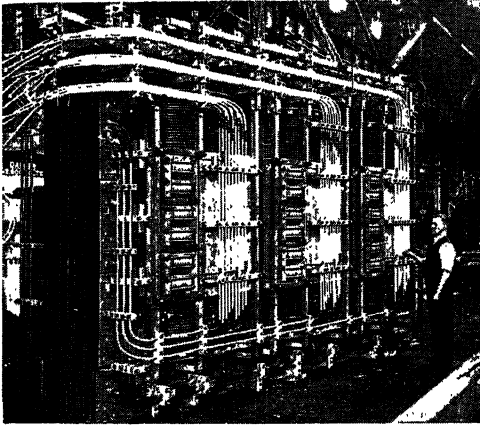
Transept (Lat. *trans*, across; *septum*, enclosure). In architecture, the transverse portion of any building lying across the main

body of that building. In the Christian basilica it was the part immediately next to the apse, the ends of its length being projected somewhat beyond the breadth of the nave and aisles. As the point of intersection was moved farther away from the apse, and the cruciform church was evolved by projecting the transept on both sides of the main building, it became usual to speak of each wing as a transept. The transept became common in the Middle Ages, and almost universal in the Gothic period. The crossing is often surmounted by a spire, tower, or dome. Single transepts are the more common, but double transepts are found in England and Germany, the English style being on the scheme of the archbishop's or Passion cross, with both arms east of the nave. In Germany the double transept was connected with the double choir, one at each end of the church.

Transfer. In law, to convey, to pass property of any kind from one owner to another. Land is transferred by deed; chattels are transferred by deed, or by delivery, or on a sale, by the appropriation of the goods to the contract. Shares in companies are transferred by deed of transfer, completed by an entry in the company's books. Govt. stocks are transferred in England by an entry in the books of the Bank of England. See Conveyancing; Land Registration.

Transfiguration, FEAST OF THE. Commemoration by the Christian Churches of the event described in Matt. 17 Mark 9, and Luke 9. According to the Scripture narratives, Christ appeared, revealed in His divine glory as Son of God, in the company of Moses and Elias (Elijah), before Peter, James, and John. The event (see also 2 Pet. 1) is supposed to have taken place at night on Mt. Hermon or Mt. Tabor, hence the name Feast of Tabor used in the Greek Church. Observed in the East as early as the 8th century, its general observance, on Aug. 6, is said to have been enjoined by Calixtus III in memory of the deliverance of Belgrade from the Turks.

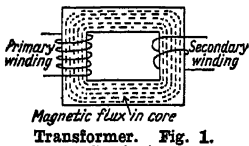
Transformer. Electrical device for changing alternating current from one voltage to another, stepping up or stepping down as required. A transformer is the simplest of converting devices, since it has no moving parts, consisting essentially of two sets of coils or windings. The primary winding is supplied with A.C.



Transformer. Core and coils of a 60,000 k.V.A. 3-phase transformer for 132,000-33,000 volt service
Courtesy of British Thomson-Houston

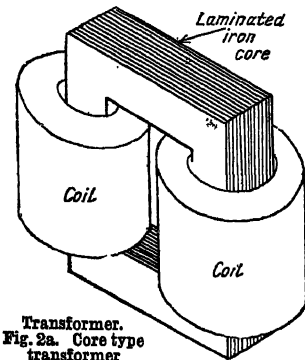
thus setting up an alternating magnetic field which cuts the conductors of the secondary winding and, by electro-magnetic induction, sets up an E.M.F. in the secondary (Fig. 1).

In order to get the best possible magnetic linkage between primary and secondary, it is usual to use a laminated iron core. To obtain the maximum amount of magnetic flux for a given magnetising current, the core is continuous, i.e. it forms a closed magnetic circuit in one of two ways (Fig. 2). In the core type of transformer the coils surround the iron core; in the shell type, the coils are surrounded by the iron circuit. Owing to difficulties in construction, the shell type is not liked in large units, and the core type is in more general use. The most perfect core from the



Transformer. Fig. 1.

See text

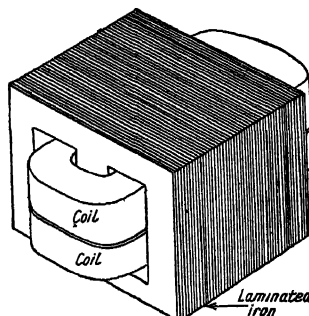


Transformer. Fig. 2a. Core type transformer

point of view of magnetic leakage is one without joints, such as a ring core built up of annular stampings. This, however, introduces difficulties in winding, since each turn

ate legs, but half of each winding is distributed on each leg—one winding surrounding the other. Three-phase transformers have usually three or five legs. High frequency transformers, such as are used in radio work, are usually made without iron cores. Another type of transformer which is becoming popular in radio is the dust core, in which the coils are embedded in a container filled with a highly magnetic ferrous powder.

The ratio between the voltages at the primary and secondary terminals is theoretically exactly equal to the ratio of the number of turns in each winding. Thus a transformer having 1,000 primary and 100 secondary turns would have a 10 to one transformation ratio and, if the primary were supplied at 1,000 volts, the secondary would give 100 volts. The currents in each winding would vary



Transformer. Fig. 2b. Shell type transformer

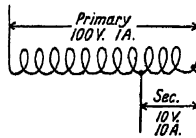
inversely, i.e. if the current taken by the secondary load was 10 amps. at 100 volts, the current taken by

the primary winding (neglecting the small losses) would be one amp. at 1,000 volts.

The actual number of turns is a matter for the designer. Although a transformer stepping down from 1,000 to 100 volts has a 10 to one ratio, it would not be suitable for stepping down from 5,000 to 500 volts or from 50 to 5 volts. There are limits to the ratio which can be obtained, although at least one transformer has been built for laboratory work in Great Britain to step up from 3,300 volts to 1,000,000 volts. The range of ordinary transformers is large, ranging from units of about five volt-amps. output for mains-operated electric bells to 75,000 kVA for the grid. Above about five to 10 kVA transformers are usually immersed in an oil-filled tank, to assist in insulation and cooling. Although the efficiency of a transformer is the highest (over 98 p.c.) of any form of converting plant, the losses in a large transformer represent much heat, and it therefore has further air or oil cooling arrangements.

Auto-transformers represent an ingenious method of saving copper by combining primary and secondary windings (Fig. 3), so that the low-voltage winding is, in effect, tapped across a portion of the high-voltage winding. The action should not be confused with that of a potential divider resistance on D.C.; it gives a true transformer action, and is capable of stepping-up or down. It is valuable where the ratio is comparatively low; for high ratios the saving in winding is negligible and the chief disadvantage (that the low-voltage winding is not electrically separate from the high-voltage and may thus be at a considerable potential to earth) outweighs any saving.

Direct-connected voltmeters cannot be used on very high voltages, and voltage or potential transformers are used to convert the supply voltage (say 11,000 or 33,000 volts) to 110 volts at the secondary winding, the voltmeter being wound for 110 volts, but (since the transformer maintains its ratio accurately) calibrated to read primary voltage. In the same way, ammeters are provided with a five-amp. winding, and operated from a current transformer connected in series with the load. The



Transformer. Fig. 3. Auto-transformer

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simplest form consists of a ring core with secondary turns wound round it, the whole being slipped over the conductor in which the current to be measured flows, thus acting as a single-turn primary.

E. B. Watton, A.M.I.E.E.

Transformer Oil. Oil used for cooling the windings of large electrical transformers. Circulation of the oil is sometimes by convection, but in large machines pumping is necessary. The oil must remain in the machine for long periods without inspection and may be subject to extremes of atmospheric temp. Its viscosity should always remain low enough for ready flow, and there must be no formation of sludge and acidic products which might hinder circulation and attack the metal parts of the machine and the electrical insulation. The oil is a light lubricating distillate which has been rigorously refined with fuming sulphuric acid.

Transfusion. Term applied to the transference of blood from one person to another. The subject is covered under the heading Blood, p. 1226.

Trans-Iranian Railway. Railway in Persia. It extends from Bandar Shah, on the Caspian Sea, to Bandar Shahpur, on the Persian Gulf, and has a total length of 872 m. Begun in 1927, it was completed in 1938 at a cost of £30,000,000. There are 225 tunnels and 852 bridges on the route, but the line, of standard 4 ft. 8½ ins. gauge, is mostly single track, and the steep gradient and winding course through the mts. restrict speed to 20 m.p.h. The rly. was a vital link in the supply of western materials to Russia in the Second Great War, when large quantities of British engines and rolling stock were used. A branch line was built to link the rly. with Transcaucasia, and in 1947 plans were made to extend it to Tabriz.

Transire (Lat., to go over or across). In shipping, a document used in the coasting trade. It is issued at the custom house of the port of departure to the master of the ship. It describes the goods and their destination, and gives other particulars about the ship.

Transit Circle. Astronomical instrument for ascertaining the time of star transits across the meridian. Invented by Olaus Römer in 1690, it consists essentially of a telescope movable in the plane of the meridian, and supported on two pillars which are respectively E. and W. of it. A

more complicated instrument, the meridian circle, measures star declinations as well as right ascensions. For this purpose there is fixed on one side of the telescope a circle which denotes its movement in the plane of the meridian, and which is read by microscopes fixed to one of the supporting pillars. On the other side of the telescope is a circle which is used for moving it.

The N. celestial pole lies somewhere in the meridian, and if it were exactly marked by the pole star, that object would lie immovable in the meridian. Then, when another star, the position of which it was desired to determine, was also in the meridian, the star's north polar distance would be ascertained by reading the angular distance on the micrometer circle. The pole star not precisely marking the celestial pole, the distance from the zenith is observed of a circumpolar star when it passes above the pole, and also when it passes below the pole. Half the sum of these distances gives the zenith distance of the pole itself. When this is known, the position of the celestial equator, which is 90° away from it, is also known; as well as that of the zenith distance of the equator. Hence there are four points from which angular distances can be measured on the transit circle (*a*) from the zenith, (*b*) from the celestial pole, (*c*) from the celestial equator, and (*d*) from the horizon, which is 90° from the zenith.

In this way by reckoning in distances from the celestial equator, is obtained celestial declination. Right ascension is reckoned from the celestial meridian which passes through the point occupied by the sun at the vernal equinox or the "first point of Aries." Delicate observations are necessary for precision. The micrometer circle of the Greenwich transit instrument is read in six different parts of the limb by microscopes. The recorded zenith distance is the mean of these recordings.

Right ascension was formerly determined by noting the precise instants, by the standard sidereal clock of the observatory, at which the star crossed each of several symmetrically disposed wires in the eyepiece, and taking the mean. This method leads to serious errors due to personal equation, by which one observer may estimate transits systematically early, and another systematically late. Nowadays the observer uses an impersonal micrometer, in

which a movable wire is kept bisecting the star image as it crosses the field of view. An electric signal is given automatically as the wire reaches certain positions in the field, and these signals are timed against the standard clock. See Telescope.

Transition. In architecture, the passing from one style to another, and the style of building during the period of passing. The transition periods between Romanesque and Gothic, and Gothic and Renaissance, may be named. The Tudor style in England represents the transition from English Gothic to English Renaissance.

Transjordan. Arab kingdom of S.W. Asia, of which the official name, adopted 1949, is the Hashimite Kingdom of Jordan. It covers an area of 34,750 sq. m. and has an estimated—because largely nomadic—pop. of c. 340,000, of whom c. 300,000 are Arab Muslims, c. 30,000 Arab Christians. The remainder are chiefly Circassians descended from settlers of the 1880s. The capital is Amman (pop. 45,000). Es Salt has some 17,500 inhabitants; none of the other towns, e.g. El Kerak, Ma'an, Irbid, has more than 5,000.

Most of the country consists of a chalk plateau of an average height of 2,600 ft. with, in the S., mts. rising to 4,600 ft., cut by numerous *wadis*, river-beds only temporarily carrying water, most of it to the river Jordan or the Dead Sea; at an average distance of 30 m. E. of a particularly deep-cut and long *wadi* linking that sea with the Gulf of Aqaba runs, from Damascus via Amman to Medina, the Hejaz rly. E. of that line the land is partly steppe, but mostly desert, with a pronounced desert climate and nearly permanent drought.

Such agriculture as there is is confined to that part of Transjordan W. of the Hejaz rly. There isolated date palm oases, some grain (wheat, millet, barley, maize) leguminous plants, tobacco, and the vine thrive. The average temp. rarely falls even in winter below 50° F., and stands at 86° and more for long periods.

About 30 p.c. of the pop. is semi-nomadic, about 13 p.c. nomadic; these two groups live almost exclusively on and with their livestock: camels, horses, sheep, and goats which are always on the move in order to find food on the meagre steppe. The remaining 57 p.c. pop. is settled. The only industry is the traditional handicrafts practised chiefly by the women;

but there is potash in the Dead Sea, and in 1947 a company was granted exclusive rights for 75 years of boring for petroleum in the S. Transport, once attended by risk of death from thirst in crossing the desert towards Mesopotamia, was simplified by the building of motor roads totalling 372 m. in 1944. The building of the road from Haifa to Bagdad across Transjordan gave great impetus to the growth of the town of Irbid.

Administration is by a king assisted by a small cabinet and a parliament, consisting of a lower house of 20 deputies, elected by manhood suffrage, and an upper house of 10 nominated by the king. For administrative purposes the country is divided into the desert area and five dists., Ajlun, Amman, Belqa, Karak, and Ma'an. Its armed forces consist of the Arab Legion (*q.v.*), numbering about 8,000, which combines military with police duties, and the Transjordan frontier force (*v.t.*), comprising 700 Transjordan and Palestinian Arabs. Education in the western sense scarcely exists.

Transjordan was a foundation member of the Arab League (*q.v.*). Her application for membership of the United Nations in 1946 was refused owing to the exercise of the veto by Russia.

HISTORY. Transjordan as such dates from the breakup of the Turkish empire after the First Great War, but it covers states of great antiquity which have left such traces as the tombs and temples cut out of the living rock at Petra, about 12 m. N.W. of Ma'an, in late Hellenic style, and the crusaders' castles at Kerak, Shobek, and Amman. The Nabataean state, first mentioned by Asurbanipal in the 7th cent. B.C., which almost coincided with Transjordan, existed until, in A.D. 106, it was vanquished by Trajan and embodied with the Roman prov. of Arabia, later Arabia Petraea; its capital was Petra (*q.v.*). That part of the country between the Lake of Tiberias and the Dead Sea was, under the name Peraea, from 4 B.C. to A.D. 39 the tetrarchy of Herod Antipas (*q.v.*). During the crusades most of Transjordan was from 1099 to 1187 included as the lordship of Montreal or Oultrejourdain in the kingdom of Jerusalem, part of it so remaining until 1291. Under Turkish rule, it became part of Syria. During the First Great War Turkish-German forces had to withdraw from the Sinai peninsula and from Es Salt, to secure a defence line for Palestine. The area

was placed under British mandate as part of Palestine in 1920.

In 1923 the U.K. recognized Transjordan as a separate country, with Abdullah (*q.v.*) as ameer, provided a constitutional govt. was set up. Recognition was embodied in an agreement of Feb. 20, 1928, ratified by both, Oct. 31, 1929. A new treaty signed March 22, 1946, ratified June 7, recognized Transjordan as a sovereign, independent state. Abdullah assumed the title of king, May 25. He played a leading part in the Arab-Jewish conflict in Palestine, 1947 onwards, and on April 23, 1950, annexed the Arab Legion-occupied area of Palestine. See Arab League; Arab Legion; Palestine in N.V. Consult History of Transjordan and its Tribes, F. G. Peake, 2 vols., 1934; Transjordan, A. Konikoff, 1946.

Transjordan Frontier Force. Military formation established by the Anglo-Transjordan agreement of 1928. The force has a peace-time complement of 700 and is at the disposal of the British govt. in the event of war affecting British protective liabilities to Transjordan. Normally it is engaged in the prevention of smuggling. Men are recruited from Arabs, Circassians, Druses, Armenians, etc. In 1941 the force took part in the Allied campaign in Syria.

Transkeian Territories. Part of the Cape prov., S. Africa. Broadly speaking, they include all that part otherwise known as Kaffraria (*q.v.*), extending from the Great Kei river N.E. to the frontier with Natal, and thus taking in Tembuland, Pondoland, and Griqualand East, but excluding Elliot and Maclear dists. In a more restricted sense Transkei comprises Fingoland and Galekaland dists. and the Idutywa reserve. The chief magistrate of the territories, residing at Umtata, exercises some authority under the ministry for native affairs. The climate is excellent for agriculture and sheep raising, but development is backward. Scenery is delightful near the coast, and inland wildly impressive. See Kaffraria.

Translation (Lat. *trans*, over; *latum*, carried). Literally, the act of moving across. The word is used for the act of turning passages from one language into another. In an ecclesiastical sense it means the transfer of a bishop from one see to another and also for the removal of the bones of a saint from one place to another, e.g. the feast of the translation of S. Martin is kept on July 4.

Transloy, LE. A village of France, in the dept. of Pas-de-Calais. It lies midway between Péronne and Bapaume. Here during the First Great War fighting took place in the British Somme offensive of 1916. It was entered by the British, March 17, 1917, after the retreat of the Germans to the Hindenburg Line. Retaken by the latter in March, 1918, it was finally recovered by the Allies in the autumn advance. See Somme, Battles of the.

Transmigration of the Soul. Doctrine of the passage of the soul from one body to another. According to this theory the soul, proceeding from God, passes through a succession of states before returning to God. Of ancient origin, the theory enters into much philosophy and poetry as well as theology, and is found in a crude state among some savage races. See Reincarnation; Metempsychosis.

Transom (Lat. *transtrum*). Beam or bar of wood, stone, or metal laid horizontally across a



Transom in architecture

door or window. With a window it serves to divide the upper and lower lights.

Transparent Print. Paper impression laid on glass and so treated with varnish that when held before a light it becomes transparent. It

was the invention of Edward Orme, who in 1887 published an essay on the process. The prints, being cheap, sometimes took the place of painted glass.

Transplanting. Horticultural process. This is a constantly recurring task, and the welfare of the plants depends on its being so carried out as to cause the least damage to the roots. Seedlings of innumerable plants are raised in spring, and before they become overcrowded they must be transplanted either to prepared outdoor sites or to boxes of soil in which they are set a few ins. apart. The work is best done by thrusting a small handfork into the soil well below the seedling plants. When they are replanted they should be set so that the lowest leaves rest on the soil. In moving herbaceous border perennials, it is sufficient to dig all round them to the depth of the

garden fork and then prise them up. In transplanting trees and shrubs of fair size, a trench 20-24 ins. deep is dug at 2 ft. or so from the stem, and the soil is forked away from beneath the bush, which can then be lifted. The best time to transplant leaf-losing kinds is in Nov. or as soon as most of the leaves have fallen. Evergreens should be moved in Sept.-Oct. or in April-May. It is necessary to water thoroughly after transplanting. If a large tree has to be transplanted, a trench is dug a year previously at about 3 ft. from the stem, and all roots found stretching beyond that are cut off; a special machine is required if the tree is to be moved any distance.

Transport (Lat. *trans*, across; *portare*, to carry). Movement of men and materials. The beginnings of transport were on rivers, and hence the great cities whose origin can be traced back to very early times, e.g. London, Paris, Rome, Alexandria, are situated on a river or near to the sea. The invention of the sail marked a great advance in sea transport; that of the wheel and the building of bridges brought great developments of land transport. Systematic road-making began when water transport was already highly organized. The Romans were first to recognize the strategic value of highways.

Transport conditions throughout the world, by both land and sea, remained virtually unchanged from the fall of the Roman Empire to the end of the Middle Ages. Roads were constructed and improved with the growth of old and the rise of new cities, and maritime and inland water transport increased in importance, but methods and appliances changed little. The large-scale production of coal in the N. of England led to another of the great transport inventions, the tram road, a primitive rly. on which the coal wagons could be hauled by horses from the collieries to points of shipment with less effort than along the highway.

The latter part of the 18th century witnessed the development of the canal system and of the stage coach. During the same period British inventors brought to perfection the steam engine and applied it to, among other things, rlys. The Stockton and Darlington rly. line, opened in 1825, is a landmark as the first public rly. in the world. Rapid development of rlys. and of steamships followed. Electrification is the outstanding rly. development of the 20th century.

The development of rlys. led to the gradual decay of the road as a means of transport. Revival began with the safety bicycle and was immensely stimulated by the invention of the internal combustion engine, parent of the motor car, which, developed originally as a pleasure vehicle, became during the 20th cent. of increasing importance for the conveyance of passengers and merchandise.

The application of the internal combustion engine to heavier than air flying machines produced a 20th century revolution in man's attitude to distance. It became possible to read a London paper in New York within 36 hrs. of its printing; the journey from England to N.Z., occupying many months under sail, reduced to weeks by steamship, could be made in five days by air. Increasing size of aeroplanes gave increasing carrying capacity, so that it was possible in 1948 for the Allies to keep more than two million people in Berlin supplied with food and fuel by air alone over a period of months.

Before the Second Great War transport of goods for other countries in British ships was a major invisible export which helped to balance the cost of imports into the U.K. British losses of shipping during that war, and an immense increase in the tonnage built, owned, and sailed, by the U.S.A., seriously reduced this item in Great Britain's credit account. See *Aeroplane*; *Canal*; *Motoring*; *Railways*; *Roads*; *Ship*.

Transport, Ministry of. British govt. dept. Established in 1919 with Sir Eric Geddes as its first head, this ministry coordinated functions hitherto performed by other depts. It was made responsible for safety measures on road and rail transport systems, and in 1946 became the authority for the control and upkeep of 7,500 m. of major roads in the U.K. In 1941 it absorbed the wartime ministry of Shipping, and being now called the ministry of War Transport, controlled all shipping, rlys., ports, road transport, and highway maintenance. Under it were regional port directors, divisional road engineers, and regional transport commissioners. In 1946 the shipping responsibilities were given back to the board of trade, and the ministry resumed its original title. It is not responsible for the operation of nationalised road and rail transport systems.

Transportation. System of punishment for crime. By it criminals are removed to some penal

settlement outside their own country for a period of years or for life. In England the Vagrancy Act of the reign of Elizabeth first empowered justices to order that certain classes of offenders might be sent beyond the seas, and by the reign of Charles II convicts were regularly transported to America, where they were compelled to labour on the plantations. Transportation to that colony ended with the American War of Independence, and in Jan., 1788, the first batch of convicts landed at Botany Bay in E. Australia.

About 1835 a party was formed in Australia to secure abolition of the system as far as Australia was concerned, and in 1840 the sending of convicts to New South Wales was stopped. Transportation to Van Diemen's Land (Tasmania), which already had penal settlements, continued. The Penal Servitude Act, 1853, finally abolished transportation as a punishment in the U.K. The system is still in existence in other countries.

Transport Command. Operational command of the R.A.F. Formed in 1943 to take over the functions of Ferry Command (*q.v.*), it is divided into four groups with h.q. in the U.K. Duties in war are to supply tugs for towing gliders, operate aircraft for dropping parachute troops, maintain airborne troop formations after they have landed, and act as general carriers to the R.A.F. Transport Command had a major part in the supply of ground as well as airborne forces in Burma, 1944-45, and at the end of the Second Great War in Europe ferried nearly 300,000 ex-prisoners of war to the U.K. It supplied aircraft and crews for Great Britain's share in the air service taking supplies into Berlin during the Russian blockade in 1948. Machines of the command range from twin-engine taxis for four passengers to four-engine 35-ton freighters.

Transporter Bridge. Type of bridge in which a car, suspended from a trolley travelling upon an overhead superstructure, conveys passengers, vehicles, etc., across a waterway. It usually comprises a tower on each shore supporting a suspension or girder bridge. The overhead trolley runs upon rails secured to the bridge girders, and from it the car is suspended by means of steel rods or wire ropes, with adjusting screws, arranged at such angles as to ensure rigidity and prevent swaying of the car; in some cases rigid suspension frames are substituted.

The overhead trolley may be self-propelling, but a more positive drive is obtained by securing it to a hauling rope made of steel wire, and passing round pulleys at each end of the bridge and round a winding drum in a machinery cabin. The hauling rope is actuated by an electric motor or other means. Transporter bridges were first designed by Charles Smith, and the first to be constructed was over the river Nervion, in Spain. Well-known British examples are at Runcorn-Widnes, crossing the Mersey and the Manchester Ship Canal; at Newport, Mon, crossing the Usk. See Bridge illus., p. 1423.

Transport House. Name of the building in Smith Square, London, S.W.1, occupied by the Trades Union Congress (*q.v.*) from 1928, and sometimes used as a synonym for the T.U.C. It was built for the transport and general workers union—hence the name.

Transport Tribunal. Advisory body in Great Britain. It consists of three permanent members appointed by the crown on the joint recommendation of the lord chancellor, the president of the board of trade, and the minister of Transport. Its functions are to regulate matters such as the reasonableness of charges and of conditions as to classification of merchandise, the packing of delicate articles, and what articles may be allowed carriage as passengers' luggage. By the Transport Act, 1947, the former rly. rates tribunal was renamed the transport tribunal, and its jurisdiction was extended.

Transposing Instrument. In music, an instrument which sounds in another key than that in which its music is written. The reason is technical; either the system of keys or the embouchure governing the production of the notes. If the composer is using the key of A flat he would write for the clarinet in B flat, if B, he would write for that in A. The other transposing instruments are the cor anglais, horn, trumpet, and cornet.

Transposition. Act of presenting a piece of music in other than the original key, either by writing it out, or by performing it at sight. The former is exemplified in popular ballads in different keys to suit various voices; the latter is a faculty of most practical musicians, especially conductors, organists, and accompanists. See Organ.

Trans-Siberian Railway. Main rly. of the U.S.S.R. The longest direct line in the world, it was begun in 1891, and, continuing

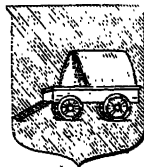
the existing line from St. Petersburg (Leningrad) and Moscow, was completed from Chelyabinsk in the Urals to Stretensk on the Shilka in 1905. A line from Chita, W. of Stretensk, branches across Manchuria to connect with the sea at Vladivostok. This Manchurian section, then known as the Chinese Eastern rly., was sold by the U.S.S.R. in 1935 to Japan's puppet govt. in Manchukuo and remained under Japanese control until the end of the Second Great War.

After the Russo-Japanese War of 1904-05, a line was begun on the Russian side of the Manchurian border and completed during the First Great War. Besides linking regions of Siberia valuable in mineral and agricultural resources, it had strategic value in the defence of the frontier. In 1929 the Turk-Sib line, running S.E. from Chkalov and S. from Novosibirsk into Soviet Central Asia (Russian Turkistan) was joined to the Trans-Siberian rly. Another branch across Siberia leaves the old line at Nizhne Udinsk, whence it follows the Lena valley for some distance, then runs N. of the Manchurian frontier to Port Soviet on the coast 800 m. N. of Vladivostok.

The length of the Trans-Siberian rly. from the Ural Mts., where it connects with the European Russian system, to Port Arthur on the Manchurian coast or to Vladivostok is nearly 4,000 m.; the total length from Leningrad to either of these termini is approx. 5,430 m.

Transubstantiation (Lat. *trans*, over; *substantia*, substance). In theology, doctrine of the change of the substance of the bread and wine, by consecration at the celebration of the Holy Eucharist, into the true Body and Blood of Christ, only the appearances of the bread and wine remaining. The doctrine is a dogma of the R.C. Church, decreed by Innocent III in 1215, and has its counterpart in the Greek Church, but is rejected by most Protestants. The word is derived from the medieval schoolmen, and its literal interpretation, implying what is called carnal manducation, has led to many superstitions and much bitter controversy. Article XXVIII of the Church of England, while rejecting the word, maintains that the Body and Blood of Christ are present "only after an heavenly and spiritual manner." The Anglo-Catholic view is that Christ's body being now spiritual, the mode in which it becomes the spiritual food of the soul is beyond words or thought. See Consubstantiation; Eucharist; Real Presence.

Transvaal. One of the four provinces of the Union of South Africa. It lies between the rivers



Transvaal arms

Vaal and Limpopo, the Vaal on the S. separating it from the Orange Free State, the Limpopo on the N. from S. Rhodesia. It is also bounded by the Cape Province, Natal, Orange Free State, and on the E. by Portuguese territory and Swaziland. Its area is 110,450 sq. m. Pop. (1946) 4,183,779, of whom 1,041,835 were European, among whom Afrikaners outnumber all other groups together. The chief towns are Johannesburg (324,304), Pretoria (124,512), Germiston (51,744). The native peoples are of Bantu stock, most of them Basutos and Kaffirs.

The greater part of the Transvaal is a continuation of the S. African plateau. In the S.E. between Standerton and Lydenburg is the high veld, with an alt. of 5,000 ft., and culminating in the Mauchberg S.E. of Lydenburg at 8,700 ft. The middle veld is between the Rand and the Vaal. The low veld, below 3,000 ft., provides good pasture. Along the boundary with Mozambique the land lies at between 600 and 1,600 ft.

The chief rivers are the Vaal and the Limpopo, which, with their tribs., drain most of the prov. The former rises in the high veld and flows W. until, just outside Transvaal, it joins the Orange. The Limpopo rises in the Magalies Berg, an isolated ridge W. of Pretoria, and flows in the opposite direction from the Vaal. Its chief tribs. are the Crocodile and the Olifants; it flows into Mozambique and to the Indian Ocean.

The temp. of the S. African plateau, between 20° and 30° S., is tropical in summer despite its alt., but less than tropical in winter. At Johannesburg (5,750 ft.) the mean Jan. (summer) and July temps are 68° F. and 49° F. The difference between day and night temps. is also great (*e.g.* Pretoria has a daily range of 35° F. in Aug.); at midday protection may be necessary against sunburn, following a morning with frost. Rain falls chiefly in summer in the form of heavy thundery showers (*e.g.* at Johannesburg there is, on the average, 33 ins. of rain in the course of 94 days). Only the inland valley of the Limpopo experiences the warm, humid conditions

common in low lands. On the high veld the sunshine totals exceed those of the French Riviera by about 700 hrs. a year.

Very little is known of the early history of the Transvaal. About 1835, Louis Trichard and Hans van Rensburg, who was killed by natives, journeyed from the Cape to the Limpopo river. News reaching the Cape of the boundless possibilities of the new country, emigration began, 1836-37, under the leadership of Potgieter. The Voortrekkers, as they were later called, crossed the Vaal and settled on the banks of the Mooi river at Pochefstroom about 80 m. from the present Johannesburg. Other settlements grew up in Klerksdorp, Lydenburg, and Rustenburg. Each little community professed the dignity, though it lacked the strength, of an independent state. Jealous of each other, they were yet forced to common defensive action against the native tribesmen. Great Britain recognized the independence of the Transvaal govt. in 1852; but in 1877, on the initiative of some of the Boer settlers, Transvaal was annexed. In 1880 the Boers rebelled, defeating the British at Majuba Hill (*q.v.*) in 1881; later that year a convention was signed granting self-govt. under British suzerainty. This was modified in 1884, when the Transvaal was renamed S. African Republic, the U.K. retaining control of external affairs except with the Orange Free State.

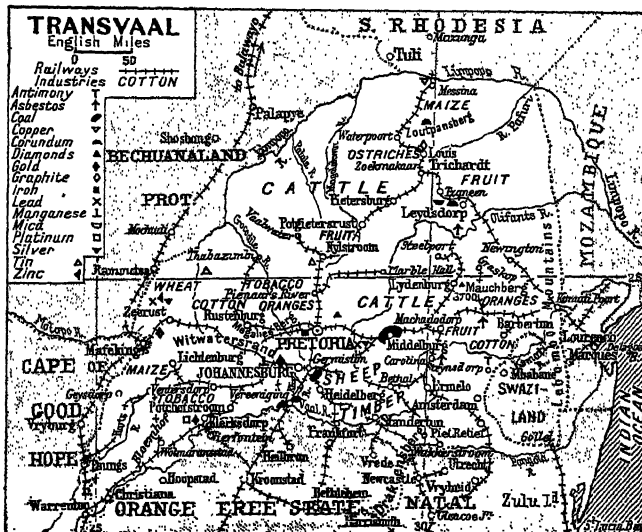
The discovery of gold on the Witwatersrand (1886) led to an influx of miners, prospectors, and speculators who soon outnumbered the Boer settlers. These rapacious newcomers and the Boer farmers, who were not interested in gold, were so antagonistic that the republic could not digest its new inhabitants and their way of life. The antagonism led to the South African War (*q.v.*) and the annexation by Great Britain of the republic, once more under the name Transvaal, on Sept. 1, 1900.

From the peace of Vereeniging (*q.v.*), 1902, the Transvaal was governed as a crown colony by a governor assisted by two nominated councils, one for executive and the other for legislative work, until in 1906 responsible govt. was granted. In 1910 the Transvaal was incorporated into the Union of South Africa.

Output of gold in 1944 was 12,277,288 oz. (£103 m.). The second most valuable mineral product is coal (£84½ m. in 1944). Diamonds valued at £63 m. were

mined in 1944. Near Pretoria is the great Premier diamond mine, largest in the world, where the Cullinan Diamond (*q.v.*) was found. More than seven tons of diamonds were extracted from this mine, but it was closed in 1932 after running for some time at a loss. Reopened in 1948, its new output was negligible. Other mineral products are copper and tin.

739 primary and junior high schools for European scholars; 1,095 state and state-aided schools for coloured, native, and Indian children. Education up to the fifth standard is in the pupil's home language (Afrikaans or English); both languages are taught to every pupil above that standard. See Jameson Raid; Johannesburg; Pretoria; South Africa, Union of;



Transvaal. Map of the South African province founded by Boer farmers in 1838

There are iron and brass foundries; brick, tile and pottery works; soap and candle factories, and other industrial establishments. Stock raising is the chief agricultural industry, cattle and sheep numbering close on 4 m. each, and goats nearly a million. Ostriches are also reared. Chief crops are maize, tobacco, potatoes, barley, oats, coffee, cotton, tea, sugar, and the vine.

On the E. border of Transvaal is the Kruger national park, nearly 8,000 sq. m. in extent, the home of almost every animal known in Africa, from the elephant to the smallest deer.

The provincial govt. is by an administrator appointed for five years by the governor-general of the Union in council, and a council of 64 elected for five years which deals with provincial finance, primary and secondary education, hospitals, roads and bridges, and other matters not pertaining to the Union govt. All ordinances passed by the provincial council are subject to the veto of the governor - general - in - council. Transvaal sends 64 members to the Union house of assembly, eight to the senate. There were in 1944

Voortrekker. Consult History of the Great Boer Trek, H. Cloete, 1899; First Annexation of the Transvaal, W. J. Leyds, 1906; Laws and Customs of the Bapedi of Transvaal, C. L. Harries, 1929; Rand Riches, H. Graumann, 1935; Century of Education in Transvaal, A. K. Bot, 1936; Fifty Golden Years of the Rand, D. Jacobson, 1936.

Transylvania. Province of Rumania. From 1868 until the break up of the Dual Monarchy, Transylvania was a dist. of the kingdom of Hungary—called by the Magyars Erdély—beyond the forest from the wooded heights of the Bihar Mts., which separated it from the Alföld. By the Germans it was called Siebenburgen, the country of the seven strongholds, the church-fortresses such as Hermannstadt (Sibiu), Grosswardein (Nagy Varad), and Klausenburg (Kolozsvár or Cluj). It forms a plateau within the E. curve of the Carpathian Mts., where the rivers have worn out well marked valleys and collect the drainage to the Maros, Szamos, and Aluta (Oltu). Under the Hungarian regime the officials, nobility, and gentry were usually Magyars; with the Szeklers.

an isolated group of people of Magyar origin in the E. Carpathians, they formed a third of the pop. The peasants were chiefly Rumanians, who formed more than half the total pop. Area, approx. 22,312 sq. m.

Transylvania was conquered about 1000 by King Stephen of Hungary, and remained part of that kingdom until the catastrophe at Mohacs in 1526. In 1691 it was again united with Hungary, its ancient privileges being confirmed, and so it remained until 1848. During 1848-60 it was a crownland of Austria; next a province with its own diet and large powers of self-government; and during 1868-1918 again part of Hungary. On Oct. 12, 1918, the Rumanians of Transylvania, the Banat, and other

tirely within Rumania. The steep slopes are on the S. side towards the Danube and are breached only by the river Aluta. The lower slopes are forested, and above the forest are wide plateau-like expanses of summer pasture on which sheep are reared. See *Roten Turm*; Rumania.

Trapani. Prov. of N.W. Sicily, bounded on three sides by the Mediterranean Sea. Along the shores are salt marshes, while the interior is mountainous. The chief products are salt, building-stone, wheat, wine, olive oil, cheese, and fish. The province was the scene of heavy fighting during July, 1943. Its area is 968 sq. m. Pop. est. 400,000.

Trapani (anc. Drepanum). Coast town of N.W. Sicily, capital of the prov. of Trapani. It is 3 m. W. of Monte San Giuliano, 45 m. direct and 121 m. by rly. W.S.W. of Palermo. The celebrated statue, the Madonna of Trapani, is in the old Annunziata pilgrim church near the town. This church escaped damage in the Second Great War, though 13 others were partly or completely destroyed. Coral goods, shell cameos, salt, marble, and alabaster wares are the principal products. Macaroni, wine, fruits, and olive oil are exported. The Carthaginians fortified the place and in 249 B.C. defeated the Romans in a great naval engagement; the port became Roman in 241 B.C. Trapani was the first town to rise against the Bourbons in 1848. During the Allied campaign in Sicily, 1943, Trapani was entered by U.S. troops July 24,

the last part of any importance to fall to the Allies. Pop. 63,540.

Trapezium. In astronomy, four bright stars grouped in a lozenge shape at the core of the Orion nebula. A photograph taken by Huggins in 1888 suggested that they were gaseous stars. It was afterwards found that the chief member of the group was in rapid orbital movement. The stars are of the early helium variety and are intimately associated with the nebula surrounding them. They range from 4.7 to 8.0 in magnitude.

Trapezium and Trapezoid (Gr. *trapeza*, table). In geometry, two four-sided plane figures. In a trapezium no two sides are parallel, and in a trapezoid two sides only are parallel. The definitions are a matter of uncertainty, some geometers interchanging them.

Trapping. The catching of wild animals by mechanical means. Traps comprise many varieties, from the ordinary steel trap with teeth for taking smaller quadrupeds, to the pits and heavy deadfalls for killing or capturing lions, tigers, and other big game. The steel trap for rabbits and similar animals has been an object of criticism, but remains in use.

Another form of snare for small animals is the box-trap, the lid of which falls upon the intruder—a development of the common mouse trap. It is useful for capturing small tree-climbing animals, as it can be placed among the branches.

A method of killing small ground-game outright is that of driving a springy sapling, some six feet in height, into the ground,

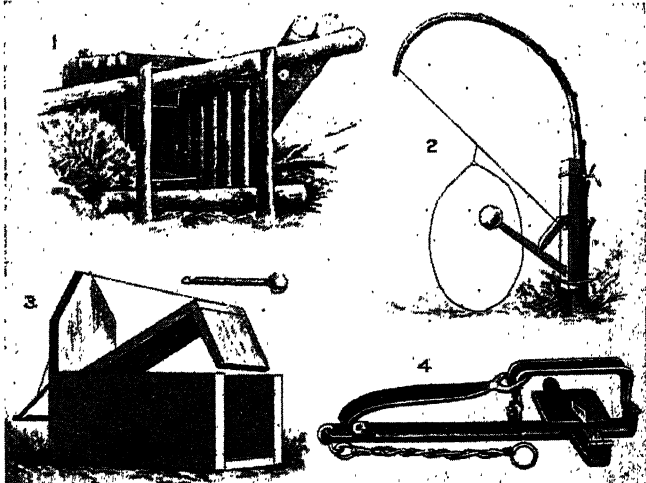


Trapani, Sicily. The famous statue of the Madonna of Trapani, hung with jewels and offerings brought by pilgrims from all parts of Italy

Hungarian districts proclaimed their independence of Hungary. At a national assembly convoked by Rumania at Alba Julia (Karlsburg), on Dec. 1, the former voted unanimously for union with Rumania, as did the Saxons of Transylvania in Jan., 1919.

Under the Vienna Award (*q.v.*) of Aug. 30, 1940, Rumania ceded the larger part of Transylvania to Hungary. Russian forces entered Hungarian-occupied Transylvania Aug. 29, 1944; after its liberation was completed, it was replaced, March, 1945, under Rumanian administration. The peace treaty between Hungary and the Allies, 1947, declared the Vienna Award null and void, the whole of Transylvania thus being reincorporated in Rumania.

Transylvanian Alps. S.E. section of the Carpathian Mts. (*q.v.*). They form the S. boundary of the plateau of Transylvania and are en-



Trapping. 1. Heavy deadfall, for large animals. 2. Sapling snare, for killing small game. 3. Box trap for catching alive, showing notched stick for bait. 4. Steel rabbit trap

and bending it backwards by a bar placed across the run of the animal and fixed against a wedge on the other side. A wire noose is suspended from the crosspiece; the quarry hopping along the track runs its head into the noose, and in its struggles to get free dislodges the bar; the sapling then springs upright, forcing the quarry off its feet and choking it.

The pit for ensnaring lions, tigers, and bears is a cavity some eight or ten feet deep, covered over the top with the brushwood and other foliage so as to correspond with the surrounding ground. This covering is arranged so as to collapse under the weight of the animal, which falls into the pit. Sometimes a bait, in the form of a kid or sheep, is placed upon the top. The reverse of this method of trapping is the heavy deadfall. A heavy beam or slab placed upon four stout uprights, or on the top of a built-up enclosure, falls and crushes the intruder as soon as the bait underneath is displaced. It is a criminal offence to set a spring trap to kill hares and rabbits except in a rabbit hole, or to fail to inspect all spring traps for hares and rabbits at reasonable intervals and at least once a day between sunrise and sunset. The same applies to setting on a pole, tree, or cairn any trap likely to injure a wild bird, or attempting to take a wild bird with a hook or similar instrument.

Trappist. Branch of the Cistercian reform of the Benedictine order. It originated at the Cistercian abbey of La Trappe in Normandy, whence it took its name. In 1662 Armand Jean le Bouthillier de Rancé (q.v.), a man of high rank who had been a court chaplain and was the owner of the abbey estates, became converted, retired to the abbey, and in 1664



Trappist monk in cowl and hood

was elected abbot. He found the community lax and disorganized, and introduced a system of unexampled austerity, the rules imposing strict enclosure, perpetual silence, and rigorous fasting. Trappist monks undertake no outside work, but employ themselves

entirely with the choir offices and manual labour. They now have about sixty houses, including the abbey of Mount St. Bernard, near Leicester. The nuns of this order keep an equally austere rule and have about twenty convents. *See La Trappe; Monasticism; consult Histoire de La Trappe, L. F. Du Bois, 1824.*

Traprain Law. Conical hill, alt. 734 ft., in E. Lothian, Scotland. It stands on the estate of the earl of Balfour, 5 m. E. of Haddington, and Viscount Traprain is the courtesy title of eldest sons of the earls of Balfour. The hill fort is supposed to have been occupied in the Stone Age, and has yielded remains of the Bronze and Iron Ages, as well as a treasury of silverwork unearthed in 1919 and believed to have been cached in the 5th century by Anglo-Saxon pirates or sea raiders.

Trap Rocks. In geology, name given to any dark coloured basic igneous rocks. Trap is practically synonymous with basalt, but the name is one which has no scientific meaning and is gradually being replaced by more definite names.

Trap Shooting. Mode of shooting which embraces two varieties: releasing live pigeons from boxes or traps; and projecting into the air, by means of a spring trap, a clay "bird" or target. The former has been illegal in Great Britain since 1921. *See Clay Bird Shooting; Pigeon Shooting.*

Traquair. Village and parish of Peeblesshire, Scotland. On the S. bank of the Tweed, it is connected by bridge with Innerleithen across the river. The Quair and other streams flow through the parish, and at the junction of the Quair and the Tweed stands a 17th-century mansion, Traquair House. Near the house is a grove immortalised in Scottish ballad as the Bush abune Traquair. The earldom of Traquair was conferred on John Stewart by Charles I in 1633; the line died with the 7th countess in 1796.

Trasimene (Ital. Trasimeno). Lake of Central Italy, in Umbria, called also lake of Perugia. It lies 12 m. W. of Perugia at an alt. of 844 ft., and is surrounded by hills, that on the N. being known as Monte Gualandro. The lake, 10 m. long by 8 m. wide and 25 ft. deep, has no apparent natural outlet, but is regulated by an artificial channel made 1896-98. The hills are covered with vines and oak and olive trees. All round its borders there was very bitter fighting between the Allied 8th

army and the Germans during June-July, 1944.

On the N. shore was fought the battle of Lake Trasimenus, between the Romans under Flaminius and the Carthaginians under Hannibal, 217 B.C. His movements hampered by a thick mist, and under the mistaken impression that Hannibal was advancing towards Rome, Flaminius entered the defile extending from Monte Gualandro to Passignano on the N. Hannibal had blocked both entrance and exit, and his heavy infantry were posted on a hill in the centre. Attacked on all sides, the Romans were hopelessly entrapped. Thousands were slain, among them the consul.

Tras os Montese é Alto Douro (Port., beyond the mts. and Upper Douro). Inland prov. of Portugal. Situated N. of the Douro, with Spain on the N. and E., it is almost wholly mountainous. Sub-tropical fruits and vines are produced in the fertile valleys. Its area is 4,570 sq. m. Pop. 592,079.

Trastevere (It., across the Tiber) Dist. of Rome. It forms the S. section of the portion of the city across the Tiber on the right bank of the river, on the slopes of the Janiculum. It is connected with the left bank by the Ponte Sisto, Ponte Garibaldi, Ponte Emilio, and other bridges. In the S. is the rly. station. S. Maria in Trastevere was founded by Calixtus I. S. Cecilia in Trastevere, originally the house of the saint, was made a church by Urban I. S. Pietro in Montorio was erected in 1500 for Ferdinand and Isabella on the traditional spot of the martyrdom of S. Peter. *See Rome. Pron. Trasteverry.*

Trau. German name of the Yugoslav town Trogir (q.v.).

Trauma. Medical and psychological term for a sudden injury, shock, or strain which precipitates a disease or neurosis. Sometimes the results of the injury are characteristic, and the chain of cause and effect obvious. But when such an incident produces insensibility, or when repression takes place, it may so upset the weakest point in the system, physical or mental, that it becomes difficult to trace the symptoms back to their precipitating cause. Should this cause be mental, it may be that the starting point of the morbid sequence lies further back than the trauma, possibly in early childhood.

Traunsee OR **TRAUN LAKE.** Lake of Austria, in the Salzkammergut (Upper Danube prov.),

also known as Gmundener See. It is $7\frac{1}{2}$ m. long, more than 600 ft. deep, and 1,385 ft. above sea level. The Traunstein on the E. side rises 4,165 ft. almost sheer above the lake level. Gmunden is situated at the N. end.

Travancore. Former Indian state in the extreme S.W. of the Deccan peninsula, now part of Travancore-Cochin. Its marshy, lagoon-fringed coast stretches N.W. from Cape Comorin, whence a 53-m. concrete road runs to Trivandrum, the capital. Cutting off Travancore from Madras are the S. spurs of the Western Ghats, known as the Cardamom Hills. Travancore has been famous since the days of Phoenicia and ancient Rome for its spices, ivory, and sandalwood. Tea and cardamom are grown in the higher ridges; pepper, rubber, ginger, turmeric in the lower. Coconut plantations abound along the coast and backwaters.

The maharaja claims descent from the great Hindu dynasty of Chera. Travancore entered into relations with the British formally by treaties, 1795 and 1805, but in 1684 a British factory had been established at Anjengo (near Trivandrum), where Laurence Sterne's Eliza was born. In 1947, after the transfer of power, Travancore joined the Union of India, and in 1949 formed with Cochin the united state of Travancore-Cochin (total area 9,154 sq. m.; pop. (1950 est.) 8,580,000). Travancore has never been annexed or conquered by a foreign power. The percentage of literacy in Travancore (58 for men and 36 for women) is far higher than for India generally; a university was opened in 1937. Hydro-electric works at Pallisaval supply cheap power to ceramic, rubber, glass, and chemical works. Communications are maintained by 5,200 m. of motor roads, 391 m. of canals, and 100 m. of rly. Medical institutions are mostly state-controlled. Matriarchal traditions give women great freedom and prominence in public life. Area, 7,662 sq. m. Pop. 6,070,018.

Trave. River of Germany, mainly in Holstein. It follows a circuitous course and enters the Baltic Sea at Travemünde, on the Gulf of Lübeck. The lower course has been canalised to serve the port of Lübeck, 10 m. upstream, and to form a Baltic terminus of the canal system of the N. German lowland. See Elbe.

Travel and Holidays Association, BRITISH. Organization to encourage the tourist industry in the U.K., formed in 1950 by an

amalgamation of the former Travel Association of Great Britain and Northern Ireland (founded 1929), and the British Tourist and Holidays board set up by the govt. in 1946. The body is governed by a chairman and 19 members, the chairman and 8 members being nominated by the board of trade. Sir Alexander Maxwell was the first chairman. Its headquarters are at Queen's House, St. James's St., London.

Traveller's Cheque. Form of cheque issued by a bank for some fixed amount, e.g. £10, which may be cashed on presentation in the specified areas by the person named thereon at banks, some hotels, and at the offices of certain travel agencies. The person to whom they are issued pays on receipt and at the same time signs each cheque. When cashed in a country other than that in which it is issued, the cheque brings an equivalent sum in foreign currency at the current rate of exchange.

Travellers' Club. London club founded by Lord Castlereagh and others in 1819. The present clubhouse, 106, Pall Mall, S.W.1, was built from the designs of Sir Charles Barry in 1832. A rule of the club decrees that every member shall have travelled to some place outside the U.K. at least 500 m. in a straight line from London.

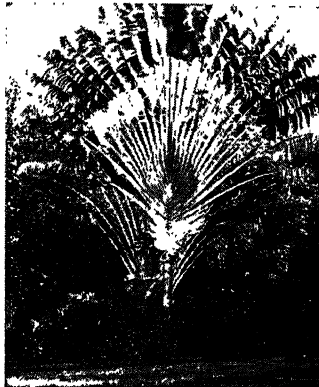
Traveller's Joy (*Clematis vitalba*). Climbing shrub of the family Ranunculaceae, a native of Europe, W. Asia, and N. Africa. It is also known as Virgin's Bower, Old Man's Beard, and White Vine. As a rule it scrambles over hedges and thickets, but often when it reaches up into a tree its rope-like stems are of great length. The opposite leaves are divided into three or five long heart-shaped leaflets, and the leaf-stalk is the climbing instrument, taking a turn round



Traveller's Joy. Flowers, buds, and leaves of the British wild clematis

twigs and hardening. The slightly odorous flowers consist of four greenish-white sepals, downy on the under surface. The numerous styles develop long white feathery tails, which in autumn become the old man's beard.

Traveller's Tree (*Ravenala madagascariensis*). Palm-like plant of the family Musaceae. It is a native of Madagascar. The trunk



Traveller's Tree. Tall Madagascan plant, the sheathed leaves of which hold about a pint of water each

is built up of the bases of former leaf-stalks, which sheathe the newer ones. The exceedingly large alternate leaves are arranged in two rows, with long stalks which are greatly dilated at the base and collect quantities of water. Numerous white flowers are clustered in large, boat-shaped spathes. The seeds are edible, and the leaves are useful for thatching.

Travels with a Donkey. Book by Stevenson, published 1879. Its full title being Travels with a Donkey in the Cévennes, it gives a vivid account of a tour by the writer and his beast Modestine in a mountainous and little known part of France. See Stevenson, R. L.

Travers, BENJAMIN (b. 1886). British playwright. He was born at Hendon, Nov. 12, 1886, educated at Beckenham and Charterhouse, and during the First Great War served in the R.N.A.S. and R.A.F. He made his name as a writer of farces when *The Dippers* was produced in 1922. The following, all at the Aldwych Theatre (g.v.) between 1925 and 1933, were by Ben Travers. A Cuckoo in the Nest, Rookery Nook, Thark, Plunder, A Cup of Kindness, A Night Like This, Turkey Time, Dirty Work, A Bit of a Test. He wrote similar shows for other theatres, as well as film scenarios for Ralph Lynn in the mid-1930s, e.g. *Fighting Stock*, *Stormy*

Weather, Pot Luck. Travers played the part of Wang, a coolie, in his own *Banana Ridge*, 1938, and wrote *Outrageous Fortune*, 1947. A vice-president of Somerset cricket club, he was elected prime warden of the Worshipful Co. of Fishmongers in 1946.

Traverse. In architecture, any structure, whether communication gallery, screen, or other barrier, set up across the interior of a building. The term is generally applied to a barrier intended to allow a private passage for ecclesiastical dignitaries or officials across a church or large public building. See Transom.

Traverse. In military engineering, a bank of earth placed in a fire trench perpendicularly to the front in order to stop bullets fired by the enemy from a flank. Traverses also tend to localise the effects of bursting shells.

In gunnery, the term describes the lateral movement of a piece of artillery about its pivot for changing the line of fire.

Traverse City. City of Michigan, U.S.A., the co. seat of Grand Traverse co. It stands at the mouth of the river Boardman on Grand Traverse Bay, an arm of Lake Michigan, 120 m. N. of Grand Rapids, and is served by the Père Marquette and other rlys. It is situated in a fruit growing region, holding an annual national cherry festival; about a million trees in the vicinity have grown from those first planted by Jesuits. It manufactures agricultural implements, furniture, foundry and machine-shop products, lumber products, and baskets. Traverse City was settled in 1850, incorporated in 1881, and received a city charter in 1895. Pop. 14,455.

Travertine OR **CALCAREOUS TUFFA.** Deposit of calcium carbonate frequently laid down in volcanic regions by hot springs. Often cellular in texture, it has a white or cream colour which recommends it as a decorative stone for the inside of buildings, especially in Italy. As it hardens with exposure it makes non-slip floors and stairs. The stone may be found containing fossil leaves and branches.

Traviata, LA. Opera by Verdi. The libretto by Francesco Maria Piave was based on the younger Dumas's well-known play, *La Dame aux Camélias*. First produced in Venice, 1853, and in London, 1856, it was not a success, but later was accepted as a serious work. The aria, *A fors e lui*, for coloratura soprano, is often sung on the concert platform.

Travnik. Town of Yugoslavia, in Bosnia. It stands on an affluent of the Bosna, 45 m. direct and 58½ m. by rly. N.W. of Serajevo. Most of its inhabitants are Mahomedans; it has two Mahomedan mausoleums, a bazaar, and an ancient citadel. The town was the seat of Turkish viziers of Bosnia, 1700-1852. Occupied by the Germans during the Second Great War, it was bombed by the Allies Jan. 4, 1944. Near by an armoured train was derailed by partisans, Oct. 7, 1943.

Trawler (O.F. *troller*, to go hither and thither). Type of fishing vessel so called because of the large nets or trawls which it uses. The trawler was developed during the 19th century, being originally a sailing vessel of 30 to 100 tons with a cutter or ketch rig. From S.W. England it was introduced to Ramsgate in 1814, Harwich 1828, Hull 1844, and Grimsby 1858. Steam trawlers, first built in 1879, developed into ocean-going ships of 600 tons or more, equipped with refrigerators and operating from Hull and Grimsby to fishing grounds as distant as the White Sea. On the British registry in 1948 were some 9,000 steam and motor vessels with a total tonnage of 264,000. In both Great Wars large numbers were requisitioned by the R.N. as patrol vessels, minesweepers, etc. See Fisheries.

Trawling. Fishing in deep waters by means of trawlers. The net used, termed the trawl, consists of an immense bag, or purse, which may be 80 ft. long. If used by a sailing boat, the mouth of the trawl is kept open by a pole of oak or elm wood, 40 ft. in length; if by a steam trawler, the mouth is opened by two "otter-boards" which, owing to the movement through the water, are forced apart.

In the process of trawling this net is dragged either by the sailing boat or the steam trawler for a given period of time over the bed of the portion of the ocean selected, care being taken to avoid as far as possible such rocky bottoms as would tear the net. At the end of the time decided upon, or after a certain distance has been covered, the net is hauled over the deck and a slipknot loosed, which allows the contents to be emptied out. Fish taken in this way are cod, plaice, turbot, whiting, sole, haddock, brill, skate, hake, gurnards, and ling. A certain number of the fish captured may exhibit bruising to some extent, partly from being dragged along the bottom, and partly owing to the weeds and

stones gathered up in the net with them. The great disadvantage of trawling is the immense destruction it causes among undersized fish which are caught in the net, especially small flat fish, and various experiments have been tried to find some means of allowing these to escape alive. See Fisheries.

Treachery Act. Temporary statute passed by the British parliament in 1940 making it a capital offence for any person to assist the naval, military, or air operations of the enemy, or to impede the forces of the crown, or to endanger life. This applied to any person in the U.K. whether owing allegiance to the crown or not, thus supplementing the law of treason, which does not normally apply to an enemy alien coming over as a spy. Sixteen spies were convicted under this Act before it ceased to be effective in 1946.

Treacle (O. Fr. *triacle*; O. Ger. *thriaka*, balm). Originally a mixture of substances believed to act as a preventive against or antidote to venomous bites. This use of the word is now obsolete, and it is almost exclusively applied to the refined mother liquor (mollasses) left after crystallising out the sugar. The sugar content varies from 40 to 50 p.c.

Treacle Mustard (*Sisymbrium officinale*). Alternative name for the herb of the family Cruciferae, also sometimes called Hedge Mustard (q.v.).

Treadmill. Wheel turned by the weight of a person or persons treading on steps fixed on the periphery. Invented by the Chinese, who used it in drawing water for irrigation, it was formerly used in



Treadmill. Example of the device formerly used as a punishment for criminals

prisons as a means of discipline or as a part of hard labour, the power being sometimes used for turning machinery or grinding corn. The first wheel used in Great Britain was erected in Brixton prison in 1817. The treadmill fell into disuse towards the beginning of the 20th century. *See* Prison and Prison Reform.

Treason (Fr. *trahison*, from Lat. *traditio*, a giving up or surrender). In general, an act of betrayal. The term is particularly applied to acts of betraying, or violation of allegiance to, the sovereign or chief authority of a state. In old English law, two forms were distinguished: high treason, where the act was directed against the crown or supreme authority; and petty or petit treason, where the allegiance violated was one towards some other superior authority, e.g. when a servant killed his master or a wife her husband. The latter was abolished as a form of treason in 1828.

High treason finds its general definitions in the statute of Edward III, 1352. Numerous fluctuating variations of treasonable offences were enacted in Tudor times, and several mitigations have since been made. The chief offences declared treason by the 1352 statute were as follows: compassing the death of the king, his wife, or heir-apparent; violation of the king's wife, daughter, or heir's wife; warring against the king within his realm, whether directly against his person, or on pretext of reforming laws, religion, etc.; overt adhesion to, or aiding and comforting, the king's enemies; counterfeiting the privy seal or the king's money; and slaying the chancellor, treasurer, or justices. Treason under this statute was punished by the traitor being hanged and disembowelled, then beheaded and quartered, attainder and forfeiture following. This penalty was mitigated in 1814 and 1870, and a traitor is now hanged.

Treason-felony was defined by the Crown and Government Security Act, 1848; it covers the offences of seeking to depose the sovereign, making war upon him in order to force a change in laws, intimidating parliament, and encouraging invasion. Certain capital treason offences were thus mitigated into felonies. Misprision of treason is the offence of concealing an act of treason; defined by an Act of 1552, it is punishable by life imprisonment and forfeiture.

The procedure in trials for treason and misprision of treason

was assimilated to that in murder trials by the Treason Act, 1945. The most important alteration was the abolition of the requirement that the treason or misprision must be proved by two witnesses. The same year John Amery was sentenced to death at the Old Bailey for treason during the Second Great War, having pleaded guilty to broadcasting on behalf of Germany, endeavouring to induce British subjects in captivity to fight for Germany against the U.K. and Russia, and making public speeches on behalf of the Axis in France and Belgium during the German occupation of those countries. *See* Joyce, William.

Treasure Island. Adventure story by Robert Louis Stevenson, first published (after appearing serially in *Young Folks*) in 1883. An 18th century story of a search for buried treasure, of piracy, and mutiny, it is a masterpiece of pure narrative. A dramatised version by J. B. Fagan was first seen at the Strand Theatre, London, 1922. There were film versions in 1934 and 1950. *See* Silver, Long John.

Treasure Trove (Fr. *trouver*, to find). Gold or silver, coin, plate, or bullion found hidden in the ground or some other hiding place the owner of which is unknown. By English law such property belongs to the crown; but it is the practice of the Treasury to return to the finder, if he has promptly reported the discovery, any articles not retained for national institutions, and to pay him the value of those retained. Articles are treasure trove only if they have been hidden, not if they have been thrown away. A coroner holds an inquest to decide. Roman law regarded treasure trove as the property of the owner of the land and the finder, who had equal shares in it. This is the law of France, Germany, and certain other countries, although the proportions given to the two parties vary.

Treasury. Dept. of the British govt. responsible for collecting and expending the national revenue. It originated as the dept. of the lord high treasurer, an official who appeared at an early date in the royal household and ranked as the third great officer of state. The office was held by several powerful personages, including Burghley. In 1612 it was put into commission for a time, and it has been in commission without a break since 1714. The last lord treasurer was the duke of Shrewsbury, who replaced the earl of Oxford.

The commission of the Treasury consists of a first lord, the chancellor of the exchequer, three or four junior lords, a parl. and a financial secretary, all being members of the govt. of the day. For some time the business was directed by the first lord of the Treasury, who was also often prime minister, but gradually it passed into the hands of the chancellor of the exchequer. The office of first lord is held by the prime minister, or the leader of the house of commons, who, like the parl. secretary and the junior lords, has nothing to do with financial matters. The parl. secretary acts as the chief whip, the junior lords act as his assistants; the financial secretary is the chief lieutenant of the chancellor of the exchequer. The permanent secretary of the Treasury ranks as the chief official of the civil service.

The national income is paid into the Treasury accounts and the national expenditure paid out on instructions from the Treasury. Until the establishment of the ministry of Labour in 1916 the Treasury controlled the administration of national health insurance. The offices are in Whitehall, London, S.W.1.

In the U.S.A. the dept. of the treasury controls the national finances. Its head, the secretary, is one of the most important members of the cabinet. *See* Budget; Chancellor of the Exchequer; Prime Minister.

Treasury Bill. Document made payable to a specified person, or, if no name is inserted, payable to the bearer, by means of which, since 1877, the British Treasury has financed much of its short-term borrowing. Treasury bills are thus a major item in the country's floating debt. They are repayable at three, six, nine, or 12 months from the date of issue, and issues are made weekly, the total amount being varied. The price paid by purchasers—usually finance houses constituting the London discount market and certain banks—is less than face value, the margin being a discount and representing the interest received by the purchaser for the use of his money for the period for which the bill is issued. The amount varies according to the state of the money market, and in particular according to the interest rate required by the larger banks for loans. Consequently the usual method of placing the bills is for the Treasury to offer a given amount for tender, and to issue bills to the highest bidders. At

the end of Sept., 1948, treasury bills to the value of £4,637 m. were outstanding.

Treasury Deposit Receipt. Document introduced in July, 1940. Such documents are issued by the Treasury to the London clearing banks, the Scottish banks, and to certain Commonwealth central banks in acknowledgement of sums lent on request by those institutions to the Treasury for a period of six months. Originally the rate of interest paid was $1\frac{1}{2}$ p.c. per annum, but in 1945 this was reduced to $\frac{1}{2}$ p.c. per annum. They can be cashed before maturity without loss of interest. During most of the Second Great War they constituted the principal method of Treasury borrowing from the clearing banks, replacing treasury bills; the method was continued later, so that at Sept. 30, 1948, treasury deposit receipts to the value of £1,449 m. were still held by the banks.

Treasury Notes. Name sometimes given to the notes for £1 and 10s. issued by the British Treasury from 1914 to 1928, when replaced by notes issued by the Bank of England. See Currency Notes.

Treasury Solicitor. English law official. He is responsible for the enforcement of payments due to the treasury, and is also the king's proctor, the official who intervenes in divorce cases. The treasury solicitor was appointed a corporation sole by the Treasury Solicitor Act, 1876, and he acts as administrator of the personal estate of an intestate which has lapsed to the crown. Until 1908 he was also public prosecutor (*q.v.*).

Treaty (Fr. *traité*, ultimately from Lat. *tractare*, to handle). Formal agreement between two or more responsible govts., by which the terms signed by commissioners are solemnly ratified, the treaty thus becoming operative. In monarchies the sovereign, and in republics the president ratifies a treaty, but in many states legislative bodies, *e.g.* in Great Britain parliament, and in the U.S.A. the senate, must give consent to ratification. Treaties may have a variety of purposes. Thus, a treaty of alliance may be offensive or defensive in character. During the First Great War Italy, though a member of the Triple Alliance, refused to declare war on Germany's side, on the ground that Germany was the aggressor, and was not simply acting in self-defence. Wars are commonly concluded by a peace treaty, in which the terms accepted by the losers are definitely set down.

Commercial treaties are usually designed to improve trade relations by granting reciprocal concessions with regard to the reduction of tariffs on the admission of specified articles or classes of goods into the countries mutually concerned.

Both political and commercial treaties may be concluded for a definite term of years, at the end of which they may be renewed. A treaty often specifies that a period of notice must be given by a party wishing to abrogate it. See Berlin, Congress of; Ryswick; Utrecht; Versailles; Westphalia.

Treaty Port. Name specifically applied to certain ports of China after the Opium War of 1840-42. The terms of the peace treaty signed on the Cornwallis off Nanking included, in addition to the cession of Hong Kong, the opening to British trade of five ports, Canton, Amoy, Foochow, Ning-po, and Shanghai, which were therefore known as treaty ports. Other such ports were opened to the trade of Belgium, France, the Netherlands, Portugal, and the U.S.A. In a series of new agreements between these countries and China, signed between 1943 and 1947, all extra-territorial rights in these ports were relinquished and complete Chinese sovereignty over them recognized. See China; Extraterritoriality.

Trebbia. River of N. Italy. Rising in the Apennines of Liguria, it joins the Po above the city of Piacenza, after a N.E. course of 58 m. The river is famous in history, for on its banks the Romans under Sempronius were defeated by the Carthaginians under Hannibal, 218 B.C.

Trebelli, ZELIA (1838-92). French operatic singer. Born in Paris, her family name was Gilbert,



Zelia Trebelli,
French singer

and she made her first stage appearance in 1859 at Madrid. She sang with marked success in Germany 1860-61, and played in Lucrezia in London in 1862. She appeared in the U.S.A. in 1878 and 1884, and made her last appearance in London in 1889. Her fine mezzo-soprano voice and her sound musical taste made Trebelli deservedly popular. She died at Étretat, Aug. 18, 1892.

Trebitz (Ger. Trebitsch). Town in Moravia, Czecho-Slovakia. It is some 18 m. S.E. of Iglau and 40 m.

E. of Brno. Here, on the banks of the river Iglava, the Benedictines erected a beautiful abbey in the 13th century. Much of it is still standing, together with the fine gateway. A trade in woollen goods is carried on, and boot and shoe-making are other industries.

Trebitsch, SIEGFRIED (b. 1869). Austrian novelist and dramatist. Born in Vienna, Dec. 21, 1869, he had won a reputation with such novels as *Weltuntergang* (End of the World), 1903, *Das Haus am Abhang* (The House on the Slope), 1906, and a drama *Ein Muttersohn* (A Mother's Darling), 1911, when in 1911 he started to publish authorised German translations of Bernard Shaw's works. His brilliant versions and active propaganda brought success to Shaw's plays in German-speaking lands before he won comparable popularity in the U.K. During 1911-35 ten vols. of Shaw's works appeared in Trebitsch's translation. Shaw translated Trebitsch's play *Frau Gitta's Suhne* under the title *Jitta's Atonement*, 1922; it was produced in 1925 at the Grand Theatre, Putney Bridge. Trebitsch made his home at Zürich.

Trebizond. The vilayet and city of Turkey once familiar as Trebizond are described under Trabzon.

Trebizond, CAPTURE OF. Russian success in the First Great War, April 18, 1916. The town of Trebizond (see Trabzon) was defended by 50,000 Turks, but the Russians forced a crossing of the river.

Treble. Term applied generally to the highest part in a piece of music, but in particular to the child's voice. When singing in parts first began to be practised, the melody was sustained by the tenor (*q.v.*), below which an additional part was placed. The next step was to add a second part above the melody, called the alto or high part. Then came the addition, still higher, of a third part, triplum, which has been corrupted into treble. See Singing.

Treble Clef. The G clef on the second line of the staff.

This sign was originally a small g, then later a capital G, which has become conventionalised by engravers into the form shown above.

Trebonius, GARUS (d. 43 B.C.). Roman soldier and statesman. Tribune of the people, 55 B.C., he introduced a bill to prolong Caesar's command in Gaul and the administration of the provinces allotted to Caesar, Pompey, and Crassus. After receiving many favours from Caesar, who made

him consul in 45, he ungratefully deserted his patron and took part in the conspiracy against him. He was governor of Asia Minor in 44, and in Jan., 43, was slain at Smyrna (now Izmir), by Dolabella (*q.v.*). Trebonius was a friend of Cicero.

Tre Croci (Ital., three crosses). Alpine pass in the Dolomites, N. Italy. It rises to 5,930 ft., and carries the carriage road from Schludersbach to Cortina. It gives fine views of the Ampezzo valley and the snow-clad Marmolata.

Tredegar. Urban dist. and town of Monmouthshire, England. The villages of Pochin, Troedrihwair, Bedwellty Pits, and Trefil are within the district. Tredegar stands on the river Howy, 24 m. N. of Cardiff. There are four rly. stations in the district: Tredegar, Bedwellty Pits, Sirhowy, and Nantybwlch. Solely industrial, the place owes its existence to the opening of coal mines and the establishment of ironworks. Pop. 19,920. *Pron.* Tredeegar.

Tree (A.S. *tréo*, tree, timber). Woody, perennial, seed-bearing plant, which develops an evident trunk. While Theophrastus (b. c. 372 B.C.) put trees, the most perfect plants, as the first group of his four classes of plants, classification today, looking for evidence of relationship by descent, finds laburnums, peas, and acacias closely related, groups the spurge with the rubber tree, and puts the apple and pear in the same family as spiraea and potentilla. The distinction between tree and shrub is not always clear, for trees growing near their climatic limits may take on a shrubby form; the tree should have a trunk of about 20 ft. before branching, whereas a shrub typically branches from ground level. Among spore-bearing plants tree-ferns alone attain the stature and form of trees. Of the six genera of tree-ferns proper, mostly tropical, some species may reach a height of 50-80 ft., e.g. *Alsophila excelsa*; but their stems are not of true woody structure.

Both the great divisions of seed-bearing plants include trees—the gymnosperms (*q.v.*), embracing the very large group of the coniferae (pine, fir, larch, spruce, etc.), also the cycads (*q.v.*), the gnetums, and the unique remaining representative of the ginkgoales, the maiden-hair tree (*q.v.*), *Ginkgo biloba*. The second great group, angiosperms (*q.v.*), includes all the broad-leaved trees, oak, ash, elm, palm, olive, rubber, etc.

The coniferae, among which are found the oldest living things, also

the largest living structures (see Sequoia), originated in the Palaeozoic era, apparently as mountain trees. They form vast forests growing to the northern tree limit in sub-Arctic regions of Europe, Asia, and N. America (see Taiga) and grow at high alts. even in tropical countries. This large group is evergreen with the exception of the larches (*Larix*), *Pseudolarix*, and *Taxodium*, which are deciduous. Of great economic importance, the pines, spruces, Douglas firs, redwoods, etc., commercially known as softwoods, give excellent timber, while the long fibres and good cellular content of many of them, such as yellow pines, spruce, hemlock, Douglas fir, provide paper-making material.

The angiosperm group is of later origin, dating back, perhaps, to the Jurassic. The group divides into monocotyledons (including palms, yuccas, etc.), and dicotyledons, the most varied, abundant, and typical group, containing the broad-leaved timber trees, or hardwoods, e.g. oak, ash, elm, fruit trees, and forest trees of temperate and tropical climates. Among their products are gums, dyes, waxes, perfumes, fruits (citrus and others), cabinet woods, alkaloids, varnish components; their timbers include teak, black ebony (Diospyros) of tropical Asia and Africa, the hickory of the U.S.A., the varied group known as mahogany, as well as the English oak, etc.

The typical tree may be said to have a root area of about equal size to its branch extension. The disposition of the branches and the position and angle of the leaves are influenced by gravity and by the effect of light itself (see Heliotropism) so that each branch and leaf may receive sufficient light, but in tropical climates be protected from an excess (see Leaf). Yet every tree has a distinct and recognizable shape and formation so that in winter or summer by its outline alone the beech is distinguishable from the oak and the elm from the wych elm.

The effect of forest areas on soil and water supply in a countryside is dealt with under Forestry and Afforestation, and the distribution of the various types of woodland under Forest. For the structure of wood see Phloem; Wood.

Tree, Sir HERBERT BEERBOHM (1853-1917). British actor-manager. The son of an Anglo-German merchant, Julius Beerbohm, he was born in London, Dec. 17, 1853, and educated in England and Ger-

many. After playing as an amateur he made his professional début in London under the stage name of Beerbohm Tree, at the Park Theatre, Camden Town, in 1878. In 1884 came his first great success as the Rev. Robert Spalding in *The Private Secretary*, at the new Prince of Wales's Theatre. Three



Sir Herbert Tree,
British actor

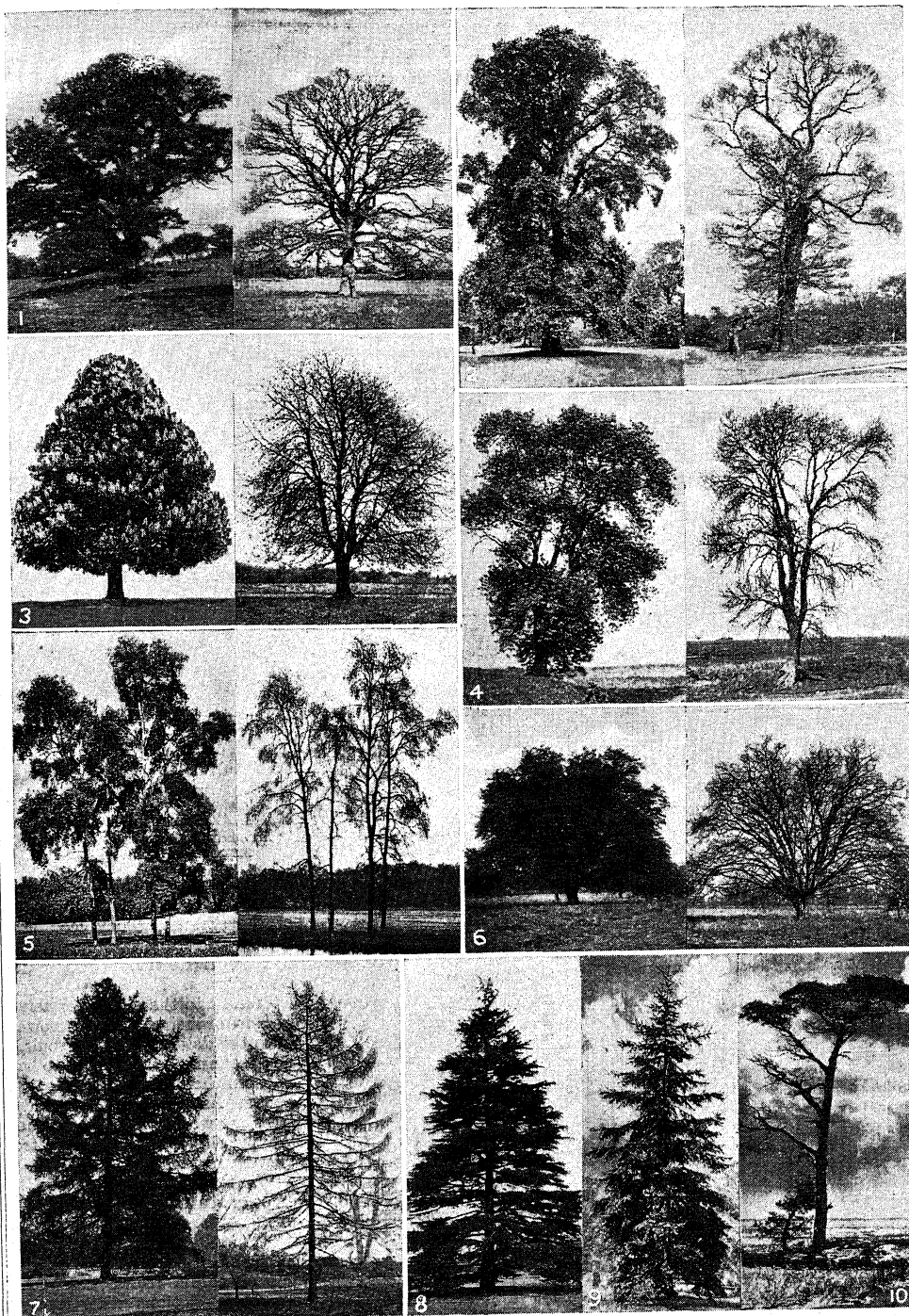
years later he opened in management at the Comedy Theatre, producing *The Red Lamp*, in which he played Paul Demetrius. Shortly afterwards he moved to The Hay-

market and began a long series of successes which included Shakespearean and Sheridan revivals.

The production of *Trilby*, 1895, was another great success. In the acting of Svengali, Tree rose to a height he had not previously attained and seldom reached again. After a tour in the U.S.A., he opened at Her Majesty's, which had been rebuilt, and began the series of successful productions with which his name is associated. They were characterised by their lavish style, which, especially in the Shakespearean plays, was freely criticised by many who considered the beauty of the original lost in Tree's gorgeous setting. His Shakespearean festivals of 1905 and 1911 were, however, well received.

Among the best known parts he played at Her Majesty's were Sir Peter Teazle, in *The School for Scandal*, many times revived; King John, 1899; Bottom, 1900; Herod, 1900; Ulysses, 1902; Falstaff, with Ellen Terry and Mrs. Kendal, 1902; Fagin, in *Oliver Twist*, 1905; Colonel Newcome, 1906; Shylock, 1908; Wolsey, 1910; Drake, 1914; and Micawber and Peggotty, in *David Copperfield*, 1915. In 1916 he made a lecture tour of the U.S.A., and shortly after his return died, July 2, 1917. Tree was knighted in 1909, and on the death of Irving became president of the theatrical managers' association. *Consult* Life, Max Beerbohm, 1920.

He married Helen Maud Holt (1863-1937) in 1883. Born Oct. 5, 1863, she first appeared on the stage at the age of 20, and acted with her husband at the Haymarket, 1887, and in the U.S.A. She remained on the stage after Tree's death, her last appearance being in *Our Own Lives*, 1935. Her best-remembered part was that of



These pictures reveal the characteristic shapes of some of the common trees of Great Britain as seen in summer and winter. Nos. 1-7 show deciduous trees: 1. Oak. 2. Elm, one of the tallest of British trees. 3. Horse

chestnut. 4. Ash. 5. Aspen poplar. 6. Hornbeam. 7. Larch. 8, 9, and 10 show three evergreen trees, whose appearance remains the same in summer and winter: 8. Cedar. 9. Spruce. 10. Scots pine

TREE: SOME OF THE BETTER KNOWN SPECIES SEEN IN GREAT BRITAIN

Lady Teazle in *The School for Scandal*. She scored minor triumphs in the films *Wedding Rehearsal*, and *The Private Life of Henry VIII*. She died Aug. 7, 1937.

Viola Tree (1884-1938), daughter of these two, was born July 17, 1884. She acted in several of her father's Shakespearian productions, and later studied singing, playing in Gluck's *Orpheus*, 1910. During her management of the Aldwych Theatre, she was responsible for introducing the Guitry family to the London stage in 1920. Her reminiscences, *Castles in the Air*, appeared in 1926. She died Nov. 15, 1938.

Tree Creeper (*Certhia familiaris*). Small British bird, which derives its name from the habit of creeping about



Tree Creeper seeking insects in the bark of a tree

the bark of trees. It is five ins. long, and its plumage on the upper parts is mottled with dark brown, yellowish brown, and white. The wings are brown, barred with white and yellow, and tipped with white; the tail is reddish brown, and the breast is whitish. The beak is long, curved, and slender, and is used for extracting small insects and their eggs from crevices in the bark.

Tree Fern. Various species of fern of the genera *Alsophila*, *Cyathea*, *Dicksonia*, etc. Their rootstock grows so far out of the ground as to constitute a spurious trunk consisting mainly of the bases of former fronds. Some of them are as tall as palms, which they much resemble in the barestem and wide-spreading crown of fronds, each frond in some species being 30 ft.



Tree Fern. Fronds and spurious trunk of *Alsophila phalerata*, a species of palm-like fern

long. They are natives of tropical and temperate regions. See Fern.

Tree Frog. Family of frogs, arboreal in habit. There are about 150 species, and they may be recognized by the adhesive disks on the toes which enable them to cling to the leaves and stems of trees. Usually green in colour, and difficult to distinguish when at rest among the foliage, they spend



Tree Frog. The European species, *Hyla arborea*
W. S. Berridge, F.Z.S.

all their time in the trees, except in cold or very dry weather, when they hide in mud or under stones, and in the breeding season, when most of them visit the water for spawning. One species (*Hyla arborea*) is common in Central and S. Europe, and has become naturalised locally in the Isle of Wight. It is a very expert climber, and hunts among the foliage for insects, grubs, and spiders. See Frog; Protective Colouring colour plate.

Tree Kangaroo (*Dendrolagus*). Genus of arboreal kangaroos, found only in Australia and New Guinea.



Tree Kangaroo. Black species of the arboreal kangaroo found in Australia and New Guinea

There are about seven species, black or dark grey in colour, with the front and hind limbs nearly equal in length, thus differing markedly from the ground kangaroos. They feed mainly on fruit and ferns.

Tree Mallow (*Lavatera arborea*). Shrub of the family Malvaceae, a native of the European coasts. It forms a stout, erect, woody stem

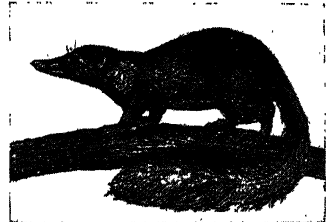
five or six feet high, and its large, roundish leaves are cut into from 5 to 9 lobes with toothed edges.



Tree Mallow. Leaves and flowers of the shrub; inset, single flower

The glossy, purple flowers, much like those of mallow and hollyhock, are 1½ ins. across.

Tree Shrew (*Tupaia*). The family of the arboreal shrews, found only in India and Malaya. In general appearance they



Tree Shrew. Squirrel-like arboreal mammal of India and Malaya

rather resemble small squirrels, but have the typically long muzzle of the shrews. They feed upon insects and fruit.

Tree-Worship. Ritual veneration of trees. The worship may be addressed to the trees themselves, because of their mysterious powers, or to the deities, departed souls, or non-human spirits deemed to have in them their casual or permanent abode. Associated with individual trees or a whole species, it pervades the primitive culture of all tree-bearing regions.

Whatever may have been the emotional attitude towards trees of primeval Stone-Age hunters, Neolithic man, who accomplished tree-felling and the systematic harvesting of edible fruits, established mystical relations with trees as animate objects affecting his daily life. Many factors concurred in these developments, from the Semitic recognition of the reproductive principle, exemplified in the date-palm, to the Egyptian conception that incense-yielding trees possessed the power of animating the dead. In

early Mesopotamian art a sacred tree is portrayed between two worshippers, a piece of symbolism which passed into Hellenic, Byzantine, and other art.

Sacred juju trees stand in every W. African negro village, and in S. India similar aboriginal cults prevail. In Bengal plantains ensnathed in women's clothing are objects of worship. Libations and animal sacrifices are other ritual usages. The consultation of tree oracles, such as the oak of Dodona, the oak cult of the Druids, and the reverence of Bo trees in India and Ceylon, exemplify special forms.

Modern European folklore and custom furnish many survivals, as in such ineradicable usages as the maypole, the Christmas-tree, and the mistletoe bough. *See* Anthropology; Asherah; Dryad; *consult* The Sacred Tree, in Religion and Myth, J. H. Philpot, 1897.

Trefoil (*Trifolium*). Genus of leguminous plants, the leaf of which consists of three leaflets. *See* Clover; Shamrock.

Tregaron. Town of Cardiganshire, Wales. It is on the Brenig, 10 m. N.E. of Lampeter, and has a rly. station. It was formerly a borough and a market town, but its privileges as a parliamentary borough were taken away in 1742, and soon the market was discontinued. Tregaron is now chiefly a holiday resort, with excellent fishing for salmon and trout and within easy reach of the wooded beauty around the Teifi Lakes, Strata Florida Abbey, and Devil's Bridge waterfall. Pop. 6,216.

Tréguier. Seaport of France. In the dept. of Côtes-du-Nord, it stands on the river of the same name about 6 m. from the English Channel, and 11 m. E.N.E. of Lannion. There is a station on a branch rly. The chief building is the cathedral, a fine edifice of the 14th and 15th centuries, for the town was the seat of a bishop from about 900 to 1790. Fishing is carried on. Renan was a native of Tréguier.

Treharris. Township of Glamorgan, Wales. Included in the co. bor. of Merthyr Tydfil, it lies 14 m. N. of Cardiff, in a colliery district, and has a rly. station. Pop. 7,440.

Treinta y Tres (Spanish, 33). Uruguayan department. With an area of 3,682 sq. m., it is bounded E. by Lake Mirim; N. by the dept. of Cerro Largo, W. by Durazno and Florida, S. by Lavelleja and Rocha. It is drained by the Olimar and tributaries. The capital, with the same name, is on the rly. 158 m. N.E. of Montevideo. The name commemorates an ex-

plot of 33 patriots who rose against the Brazilian authorities in 1825. Pop., dept., 68,850; town, 21,500.

Treitschke, HEINRICH VON (1834-96). German historian and publicist. Born at Dresden, Sept. 15, 1834, he studied at various German universities, and obtained an appointment at Leipzig university in 1857. In 1863 he moved to Frei-



H. von Treitschke,
German historian

burg and later to Kiel and Heidelberg. His writings and speeches at this time were fiery appeals for the foundation of a German kingdom. He entered the Reichstag in 1871, but retired in disgust in 1888. Meanwhile he had become professor of politics at Berlin, and gained a reputation for his virile and eloquent lectures which consistently supported his doctrine that Germany would inevitably become the dominating and model state of Europe; and he commended war as a means of fulfilling that destiny. For 15 years he inculcated this lesson into tens of thousands of youths. His later years were embittered by the growth of socialism and the influence of Nietzsche. He died in Berlin April 28, 1896. His chief work is his *History of Germany*, 5 vols. (Eng. trans., 1915-19); but his ideas are best illustrated in *Politics*, 2 vols. (Eng. trans., 1916). In the early days of the First Great War his name and works aroused interest among British people earnestly seeking some explanation of Germany's aggressive attitude. *Consult* Life and Works, A. Haus-rath, Eng. trans., 1914.

Trelawny, EDWARD JOHN (1792-1881). British adventurer. Of an old Cornish family, he was born Nov. 13, 1792. He entered the navy, but soon deserted and wandered about the world, even taking to piracy. He is remembered chiefly as the friend of Shelley and Byron, whom he met first in Italy in 1822. He superintended the cremation of Shelley and then went to Greece with Byron, but left him to join a band of insurgents fighting for Greek



Edward Trelawny,
British adventurer
After Stearn

independence. Trelawny's later years were spent in England, where in spite of being a liar on the grand scale he was a distinguished figure in society. He died at Sompning, Sussex, Aug. 13, 1881. Trelawny wrote *Adventures of a Younger Son*, 1835; and *Recollections of the Last Days of Shelley and Byron*, 1858. Both works throw some light on these poets. *Consult* The Friend of Shelley, H. J. Massingham, 1930.

Trelawny, SIR JONATHAN (1650-1721). English prelate. Son of a Cornish baronet, he was born at Pelynt, the family seat, March 24, 1650, and educated at Westminster and Christ Church, Oxford. He was ordained in 1673, and after 12 years, having meantime succeeded to the baronetcy, was appointed bishop of Bristol. In 1688 he was translated to Exeter, and in 1707 to Winchester, where he finished the rebuilding of Wolvesey Palace. Trelawny was one of the seven bishops who resisted James II. He died July 19, 1721. The baronetcy fell to his brother. The song with the old refrain, And Shall Trelawny Die, was written in the 19th century by R. S. Hawker, but the refrain had been sung both when the bishop was in prison and when his grandfather suffered a like fate in the time of Charles I.



Sir J. Trelawny,
English prelate

Trelawny of the Wells. A comedy by Pinero, first produced at the Court Theatre, London, Jan. 20, 1898. This well constructed comedy became one of the most popular pieces of its time. The Trelawny of the title is Rose Trelawny, a young actress of the Bagnigge Wells theatre. This part was originally played by Irene Vanbrugh. Another leading character is based on the dramatist Tom Robertson (*q.v.*). There were many revivals, e.g. at the Duke of York's Theatre, 1910; Kingsway Theatre, 1915; Old Vic, 1925 and 1938.

Trelew. Town in the Chubut territory of Argentina. One of the most important places in Patagonia, it was founded by Welshmen. It lies 43 m. by rly. S. of Puerto Madryn, being the junction for Rawson, in the heart of a sheep-rearing district. Pop. 7,000.

Treloar, SIR WILLIAM PURDIE (1843-1923). British business man and philanthropist. Born in Lon-

don, Jan. 13, 1843, he was educated at King's College school. He became a member of the corporation of the



Sir William Treloar,
Lord Mayor of London
Downey

City of London in 1880, and a l d e r m a n, 1892. He was sheriff, 1899-1900, and then knighted. In 1906 he was elected lord mayor, receiving a baronetcy next year. Principal of the firm of Treloar & Sons, carpet merchants, he founded the Lord Mayor Treloar cripples' hospital and college at Alton and Hayling Island. He wrote Ludgate Hill, Past and Present, 1881; Wilkes and the City, 1917; A Lord Mayor's Diary, 1920. He died Sept. 6, 1923.

Tremadoc Series. In geology, a group of rocks occurring at the top of the Cambrian (*q.v.*) system. They are typically found at Tremadoc, Carnarvonshire, and can be traced to Crickieth, Arenig, and Cader Idris. They consist mainly of slates, mudstones, and shales.

Trematodes. Order of parasitic worms which affect the vertebrates, including man. They are most often found in the intestines, liver, lungs, or bladder. The liver fluke (*q.v.*) of sheep is a common form.

Tremolite. In mineralogy, one of the amphiboles of the tremolite-actinolite series. Tremolite is a calcium magnesium silicate containing hydroxyl. Fibrous varieties form commercial asbestos in part, while fine-grained compact varieties of tremolite or actinolite form nephrite, a variety of jade (*q.v.*). These minerals occur in metamorphic rocks.

Tremolo (Ital., trembling). Musical effect attained on bowed instruments by a rapid iteration of a note indicated thus:



and on the pianoforte by the alternation of two or more notes, thus: In singing it is held to be a vice.



Tremor (Lat., a trembling). Involuntary rhythmic oscillations of part of the body, due to alternate contraction and relaxation of a group of muscles and the opposing muscles. Tremor may be the result of fatigue or emotion, or be a manifestation of neurasthenia, or result from chronic poisoning, etc.

The term is also applied to minute but perceptible movements of the ground as a result of a small local shock or a main earthquake at some distance. Only the rapid movements can be felt, later oscillations being slower and too small to be detected; e.g. the earthquake originating near Ghent on June 11, 1938, was felt in Great Britain for a few seconds. Disturbances of the ground may cause a continuous trembling effect.

Tremulant. Mechanical device for simulating in the organ the effect of the tremolo (*q.v.*). It consists of a small box, having a weight valve upon a spring. This is attached in such a way as to interfere with the pressure of the wind supply when the requisite stop handle is drawn, thus producing a pulsating effect, the frequency of which can be regulated. Use is generally confined to solo stops.

Trench (Fr. *trancher*, to cut). Narrow cut made in the earth. In its agricultural sense, trenching means digging trenches in the soil to facilitate the growth of vegetables and crops. This is done on a large scale with a trench plough. Trenches for burying water mains, electric cables, etc., are cut by mechanical excavators.

In military engineering, a trench is an excavation made to protect troops from enemy fire and at the same time enable the occupants themselves to fire. Such excavations have from earliest times been used in the defence of camps and as part of fixed fortifications, but not until the First Great War did the trench become the principal feature of military operations. Then elaborate systems were involved, the front line trenches having behind them lines of support trenches, joined by communication trenches. Dug-outs accommodated troops, and more permanent entrenchments were sometimes made of concrete. The mobile operations of the Second Great War rendered elaborate entrenchments unnecessary; but temporary slits in the ground gave protection against artillery or air bombardment during an advance. See Fortification; Tactics; Trench Warfare.

Trench, RICHARD CHENEVIX (1807-86). British divine and author. Born in Dublin, Sept. 9, 1807, he was educated at Harrow and Trinity College, Cambridge. He was curate to Samuel Wilberforce and rector of Itchenstoke before being made professor of divinity at King's College, London, in 1846. In 1856 he received the deanery of Westminster, and from

1864 was archbishop of Dublin, his term of office covering the disestablishment period. He resigned in 1884 and died in London, March 28, 1886. Trench is remembered by his books on philology, The Study of Words, 1851, and English Past and Present, 1855.

Trenchard, HUGH MONTAGUE TRENCHARD, 1ST VISCOUNT (b. 1873). British administrator. Born Feb. 3, 1873, he went into the army in 1893, and was with the I.F.Y. in the S. African War. Awarded the D.S.O. in 1906, he commanded the N. Nigeria



regiment (W.A.F.F.) during 1908-13, and in the First Great War held command at the central flying school. In the closing months he was in charge of the independent air force in France. Chief of air staff and an air marshal from 1919, he was promoted, 1927, marshal of the R.A.F., of which he was the virtual creator. As commissioner of the metropolitan police force 1931-35, Trenchard provoked much comment by the radical reforms he instituted, notably when he set up a police college at Hendon. Knighted in 1918, he was raised to the peerage in 1930, and became viscount 1936. He was a trustee of the Imperial War Museum, 1937-45. See Police; Royal Air Force.

Trench Fever. Disease first observed at the end of 1914, among troops serving on the western front in the First Great War. From that time onwards it was prevalent in the British, French, and German armies, and also occurred on the Italian and Russian fronts. It was an infectious disease, probably due to the louse-borne *Rickettsia quintana*. The form seen in the early months of the war was characterised by an abrupt rise of temp., the fever lasting four to six days, and then subsiding without other signs or symptoms appearing. From about 1917 onwards, the fever was more prolonged. A third type was characterised by relapses at intervals of two or three days. The more important symptoms were headache, pain in the shins or in other parts of the body, rash on the skin, and mild inflammation of the conjunctiva of the eye. Serious complications were rare. The mobile character of the Second Great War, and the use of the newly discovered insecti-

cide, D.D.T., prevented similar disease in that war.

Trench Warfare. Method of conducting hostilities peculiarly associated with the First Great War. Entrenchment was, of course, an old defensive device (see Fortification), and "digging in" was resorted to in the siege of Sevastopol during the Crimean War, as well as in the S. African War and in Manchuria. In the S. African War the Boers evolved a kind of trench, usually cut in a hillside, in which a man could stand upright or nearly so with protection from any but directly overhead fire. But never were trenches so developed as a permanent line of battle as during the four years of the First Great War, when from the retreat of the Germans from the Marne to the Aisne in Sept., 1914, to the eve of the victorious Allied advance, Aug., 1918, both sides on the western front were compelled to base all their tactics on the maintenance of an effective trench system, a system which threatened a permanent stalemate. On both sides the trenches became semi-permanent habitations, and considerable care was devoted to their construction, together with that of the accompanying dug-outs. German trenches, especially in the Somme region and throughout the Hindenburg Line, were usually far more elaborately constructed than any on the Allied side. In the winter of 1914-15, especially in the N. sections of the line, the British trenches were often many inches deep in water, which was sometimes waist-high.

The protracted occupation of trenches on so elaborate a scale led to special forms of warfare, ranging from long-distance pounding of trenches with heavy artillery to the interchange of shells from trench mortars, discharges of grenades by hand and rifle, mining and counter-mining, and trench raids. The British ministry of munitions had a special trench warfare department. But none of the tactics listed above ever promised to eliminate or override an opponent's trench system and thereby end the stalemate. That was left to the tank (*q.v.*) to achieve.

The Second Great War, in which all armies were more mobile, saw no such permanent development, the trench falling back to its old place as a means of no more than temporary cover.

Trenck, FRANZ, BARON VON DER (1711-49). Austrian soldier. Born at Reggio, Jan. 1, 1711, he entered

the Imperial service, but was obliged to leave after four years' service. Entering the Russian service he again fell into disgrace, was court-martialled, degraded and imprisoned at Kiev. In the War of the Austrian Succession he raised a Slavonian regiment at his own expense and was accused of plundering and other crimes, and condemned to death. By Maria Theresa's intervention the case was revised and Trenck was imprisoned. He died in the fortress of Brünn, Oct. 14, 1749.

Trenck, FRIEDRICH, BARON VON DER (1726-94). German adventurer. Born Feb. 16, 1726, at Königsberg, a cousin of Franz, Baron von der Trenck (*v.s.*), he entered the army and had before him the prospect of a brilliant career when King Frederick II of Russia caused

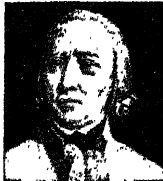
him in 1743 to be imprisoned in the fortress of Glatz, for having a love affair with the Princess Amelia. He escaped, 1746, and entered the Austrian service, but returned to Prussia in 1754, and was again imprisoned for ten years. He was eventually released at the request of the Empress Maria Theresa. Returning to Paris, he was accused in 1794 of being an agent of foreign powers, and was guillotined on July 25 of that year. His autobiography was published in 1787, and an English version, ed. P. Murray, in 1927.

Trengganu. State of the Malay peninsula. It came under British protection by treaty with Siam in 1909 and in 1948 became part of the federation of Malaya (*q.v.*). It lies N.E. of Pahang and E. of Kelantan, between a mountain ridge (Temiang, 4,082 ft.; Mandi Angin, 4,794 ft.; and Patoh, 2,041 ft.) and the shore of the China Sea, and is drained by the Besut, Trengganu, Dungun, and Cherol. Tin, wolfram, copra, and black pepper are exported. Kuala Trengganu is the capital. Area is 5,050 sq. m. Pop. 226,400.

Trenscén or **TRENČÍN**. Town in the Slovakia division of Czechoslovakia; formerly in the kingdom of Hungary. Situated on the Vág



Baron von der
Trenck,
Austrian soldier



Baron von der
Trenck,
German adventurer

E. of the White Carpathians, it is an important rly. and road junction on the routes into Slovakia from Moravia and Galicia. The town formerly had a mixed pop. of Slovaks, Magyars, and Germans. Pop. est. 11,000.

Trent. River of England, the third longest in the country. It rises in Staffordshire on Biddulph Moor, and flows mainly in an easterly, but towards the end in a northerly, direction through Staffordshire, Derbyshire, Nottinghamshire, and Lincolnshire to the Humber, which it enters near Alkborough. Its length is 180 m., and it drains an area of 4,000 sq. m. The chief tributaries are the Sow, Penk, Tame, Dove, Soar, Erewash, Derwent, and Idle; towns on its banks are Stoke, Burton, Nottingham, and Newark.

The Trent has a bore called the aegir (eagre). It is navigable for barges as far as Burton, and there is a fair amount of traffic between Gainsborough and its mouth. It is connected by the Trent and Mersey and Grand Union canals with the Lancashire and Birmingham districts, while other canals link it up with Derby, Lincoln, Grantham, and other places. The river is navigable for 45 m. from its junction with the Ouse. Large barges can go as far as Nottingham. Trent junction is a rly. station just outside Long Eaton, where the lines to Nottingham and Derby branch. Here is Trent College, a public school on C. of E. lines, founded in 1866. See Humber; Nottingham.

Trent or **TRIENT**. German and historic name of Trento, capital of Trento prov., Italy. Up to 1919 in S. Tirol, Austria, it stands on the left bank of the Adige, 76 m. N.W. of Venice. Probably founded by the Etruscans, it became the Roman Tridentum. Here between 1545 and 1563, the council of Trent held its meetings in the church of Santa Maria Maggiore. During the Napoleonic Wars the dist. was for a time in Italian occupation. Prominent among the public buildings are the white marble cathedral and the palace of the prince-bishops. Industries include marble quarrying and the making of pottery, playing-cards, and wines. Pop. 61,015.

During the First Great War the offensive of General Diaz against the Austrians, which began in the fourth week of Oct., 1918, in the Monte Grappa and Middle Piave areas, and at the end of the month on the Asiago Plateau, was extended to the whole Trentino area, from the Astico on the S.E. to the Stelvio Pass on the



Trent, Italy. View of this town in Trentino-Alto Adige, showing the river Adige

N.W., by the coming into action of the 1st and 7th Italian armies on Nov. 2. That day the first army captured Monte Majo, attacked the Borcola Pass in the Posina sector, took Monte Cimone on the Tonezza Plateau, and made other gains; while the seventh army captured Col Santo, N. of Pasubio, forced the Vallarsa, E. of Lake Garda, and near the Swiss frontier broke the Austrian front on the Selle del Tonale, thereafter marching up the Vermiglio Valley. In the afternoon the Italians advanced on both sides of Lake Garda, and in the evening held Rovereto.

On Nov. 3 the British belonging to the sixth army occupied Levico, 9 m. S.E. of Trent, and the Italian cavalry entered Trent unopposed in the afternoon of Nov. 3.

During the Second Great War, Trent, because of its position on the Brenner rly. line, was the object of Allied air raids.

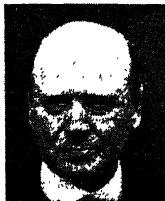
Trent, COUNCIL OF. General council of the R.C. church, held at Trent during 1545-63. Its origins have historical significance. A comprehensive definition of dogma and strong internal reforms were needed to enable the Roman church to show an undivided front against the growing strength of the Reformed doctrines. The popes generally had resisted appeals for general councils, e.g. that made by the university of Paris, 1518. In 1530 the Protestant estates demanded a "council of Christendom," and the emperor Charles V (q.v.) was strongly convinced of the necessity of reform. After various delays and postponements from 1537 a council was summoned to Trent by Pope Paul III, 1545. Over 200 fathers attended, and the sittings continued, broken partly by political developments, under Popes Julius III and Pius IV, into 1563.

Among the matters dealt with by the council (the Tridentine decrees), the most important were:

the joint value of Scripture and the tradition of the Church as standards of Divine revelation; the interpretative authority of the Church Fathers; original sin; the authority of the Vulgate, 1546; Divine origin and forms of the sacraments of baptism and confirmation, 1547; the Eucharist and penance, 1551; communion in both kinds and the sacrifice of the Mass, 1562; orders and the regulation of the hierarchy; the sacrament of matrimony; veneration of saints; indulgences; index of prohibited books, 1563. Pius IV confirmed its decrees in 1564.

The council of Trent was of great importance as guiding the R.C. church in what is often called the Counter-Reformation. The catechism of the council, summarising its decrees and definitions, was edited by Dominican scholars, and in 1564 the Roman Congregation of the Council was established to safeguard its decisions and facilitate their practice. *Consult* Lectures on the Council of Trent, J. A. Froude, 1896.

Trent, JESSE BOOT, 1st BARON (1850-1931). British businessman, born June 2, 1850. He opened a chemist's shop in Nottingham, where, forsaking old-fashioned methods, he started a chain of shops and, while selling drugs cheaply, made other goods, and established a large lending library and book-



Lord Trent

selling organization. Chairman of Boots Cash Chemists, Ltd., and an active worker for Liberalism, he was knighted in 1916, and in 1929 became Baron Trent of Nottingham.

Trent found the money for the new buildings of University College (later Nottingham univ.), and gave large sums for other im-

provements. He died June 13, 1931, and was succeeded in the title and as chairman of the co. by his son, John Campbell Boot (b. Jan. 19, 1889).

Trent Affair. Incident in the American Civil War. Towards the close of 1861 two commissioners named Mason and Slidell, dispatched by the Confederacy, embarked at Havana in the British ship *Trent*, bound for England. The *Trent* was stopped on the high seas by a Federal man-of-war, and the two commissioners were taken prisoners. Popular sentiment in America approved of the action, but President Lincoln recognized that a breach of international law had been committed, and, in response to the British govt.'s formal demand, restored the prisoners to liberty, thereby averting the menace of war with Great Britain.

Trent Bridge. Locality in the city of Nottingham, England. The bridge over the river Trent leads S. from the city to the urban dist. of West Bridgford. Here is a cricket ground famous for international as well as county matches.

Trente et Quarante (Fr., thirty and forty). Game of chance, also known as Rouge et Noir (q.v.).

Trentino-Alto Adige. Region of Italy. Formerly part of the Austrian prov. of Tirol, it lies between Lake Garda and the Brenner Pass, and is divided into the provs. of Bolzano and Trento. Roughly triangular, it touches Switzerland and Lombardy on the W., Austria on the N., and Veneto on the S.E.

The area had belonged to the old republic of Venice, and before the First Great War Italian irredentism was strong in regard to it. In 1915 Austria offered to cede the south part, where most of the people were Italian-speaking, to her then ally Italy who, however, demanded much more—a demand rejected by Austria. Under the treaty of St. Germain-Laye, 1919, Austria was compelled to give Italy even more than she had asked for in 1915.

The area ceded was formed into the region of Venezia Tridentina, divided into the provs. of Alto Adige (Bolzano) and Trentino (Trento). Until 1924 the German-speaking inhabitants enjoyed liberal treatment. Then the fascist govt. subjected them to forcible Italianisation. Many of them remained, however, German in feeling, and after Hitler occupied Austria in 1938 the German and Italian govts. came in 1939 to an agreement under

which German-speaking inhabitants were allowed to choose German citizenship and move to the Reich. In Bolzano prov. 73 p.c., in Trento 53 p.c., of those eligible voted for migration. By the peace treaty of 1947 Italy undertook to give equal rights to German-speaking inhabitants of Venezia Tridentina; to place German on an equality with Italian; and to permit those whose German family names had been forcibly Italianised to resume their former names. The name of the region was changed to Trentino-Alto Adige in 1947. Area 5,252 sq. m. Pop. 670,000.

Trento. Prov. of Italy. It forms the southern part of the region of Trentino-Alto Adige. Mountainous and with many beautiful valleys, it is a favourite tourist area. It produces wine, silk, fruit, cattle, marble, timber, and hydro-electric power. Its capital, Trento, is described under its historic German name Trent.

Trenton. City of New Jersey, U.S.A., the state capital, and the co. seat of Mercer co. It stands on the Delaware river, at the head of tidal navigation, 34 m. N.E. of Philadelphia, and is served by rlys. and the Delaware and Raritan Canal. The falls at this point of the river supply water power for various industries, among which pottery is notable. Trenton is a leading centre of education and transport as well as manufacture. It was settled about 1680, incorporated as a borough 1745, made the state capital in 1790, and chartered as a city two years later. The commission form of government was adopted in 1911. During a strike in 1936 the state legislative chamber was occupied by malcontents. Washington surprised and captured a British force in the battle of Trenton at Christmas, 1776. Pop. 124,697.

Trenton. Town of Ontario, Canada. At the head of the Bay of Quinte, in Northumberland co., 100 m. E.N.E. of Toronto, it is reached by C.P.R. and C.N.R. Industries include the transformer stations of the hydro-electric commission of Ontario, sash and door factories, and lumber, woolen, cotton, and paper mills. There are iron, limestone, and marble in the vicinity. Pop. 8,323.

Trenton Beds. In geology, name given to one of the divisions of the Ordovician system in America. The rocks are chiefly limestones and black carbonaceous shales. They are frequently used as building stones.



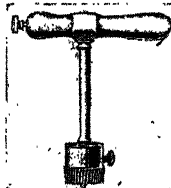
Tresco, Skilly Is. The Valhalla, or hall of the spirits of the departed, containing figure-heads of wrecked ships and other relics

Trenton Falls. Village of New York, U.S.A., in Oneida co. It is a popular summer resort, 17 m. by rly. N. by E. of Utica, and is noted for five magnificent falls on the West Canada creek, with a descent of 300 ft. in 2 m. Power from these falls operates factory processes in Utica. Pop. 310.

Trent Valley Canal. Incomplete Canadian waterway. Its object is to connect Georgian Bay on Lake Huron with Lake Ontario, 200 m. apart. By utilising several rivers and lakes it was necessary to cut only about 15 m. of new canal, and the work was in progress in 1880, but was delayed by political disputes. The existing waterway, starting from Georgian Bay, follows the river Severn to Lake Simcoe, from which it passes by several small lakes beyond Peterborough to Rice Lake in the Trent valley, thence to Trenton and so into Lake Ontario. The term canal is a misnomer: only 33 m. of the total 240 m. is artificial waterway.

Trepang. Native name for sea cucumber or bêche de mer (*q.v.*).

Trepanning (Gr. *trypanon*, a boring instrument). Surgical operation. The improved kind of trepan, or trephine, is a cylindrical saw, used in cutting out a piece of bone from the skull. This operation is done to remove a bullet or a fragment of bone which may



Trepanning. Trepan or trephine used in this surgical operation

be pressing on the brain as a result of fracture of the skull, or to open an abscess in the brain, or remove a blood clot or tumour, or relieve pressure within the skull due to the growth of a tumour or some other disease. Very ancient skulls have been found with rounded perforations in them, which suggest that this operation was performed in early times.

Tresco. Second in size of the Skilly Isles. Considered by many visitors the most beautiful, it lies 1 m. N.W. of St. Mary's. It contains the ruins of a 10th century Benedictine abbey church. The residence of the proprietor of the Islands, Major Dorrien-Smith, is built on the site of the monastic buildings, and world-famous tropical gardens are maintained. At the N. end of Tresco stands the ruined Cromwell's castle, to the E. of which is Piper's Hole, a low cavern extending 600 ft. There are two fresh-water lakes. Pop. 191. See Skilly Isles.

Trespass. In English law, a wilful injury to the person or property of another. There are three kinds of trespass, viz. to land, to goods, and to the person. Trespass to land, called in the old books trespass *quare clausum fregit*, wherein the trespasser broke and entered the plaintiff's close, was in theory an act of violence: therefore the old pleaders always described it as having been committed *vi et armis*, by force and arms, even when the defendant had merely walked across a field. It is merely a tort, not a crime, except in a few special cases like trespass on rly. property. The plaintiff is entitled to recover the actual damage done by the defendant, and the court or jury may award exemplary damages in aggravated cases.

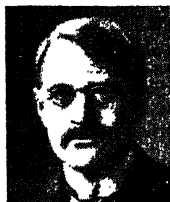
Trespass to goods is any wrongful touching of, or damage to, or taking of the plaintiff's goods. Damages may be awarded on the same principles as above. Trespass to the person is another name for assault. Damages in this case may be nominal; if not, they are generally exemplary, proportioned to the violence used, the injuries inflicted, and other circumstances.

Tressure. In heraldry, a thin border round a shield, but not touching the edges. It is really a diminutive of the border or orle (*q.v.*). See Heraldry colour plate.

Trestle. Vertical framing, formed by vertical and horizontal

members and diagonal bracing, which serves as a support, *e.g.* trestle piers of bridges. Trestles are sometimes of great height, *e.g.* the iron piers of the Loa bridge on the Antofagasta rly., one trestle of which is 300 ft. high from its base.

Trevelyan, GEORGE MACAULAY (b. 1876). British historian. Third son of Sir George Trevelyan (*v.s.*),

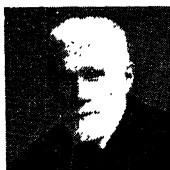


G. M. Trevelyan,
British historian

he was born Feb. 16, 1876, and educated at Harrow and Trinity College, Cambridge. Studies of England in the Age of Wycliffe, and England under the Stuarts, 1907, gave him reputation; then came the great trilogy, later issued in one volume, on the adventures of Garibaldi in 1848 and 1860, to produce which Trevelyan covered every yard of ground he wrote about in Sicily and Campania. He went back to Italy in command of the 1st British ambulance unit in 1915. Lives of Bright (1913) and Grey of Fallodon (1937), British History in the 19th Century (1922), and the 700-page History of England (1926) established him as an historian who, with the slightest bias in favour of the Whig and Liberal tradition, presents brightly and profoundly British constitutional development.

Trevelyan was made regius professor of modern history at Cambridge in 1927. The award of the O.M. in 1930 suggested that he was the acknowledged leader in his field. That year Blenheim came out, first of a trilogy on England under Queen Anne, to be followed by Ramillies and the Union with Scotland (1932); The Peace and the Protestant Succession (1934). In 1940 he was elected master of Trinity. English Social History proved in 1944 that scholarship could produce a best-seller. Autobiography and Other Essays appeared 1949. Chairmanship of the estates committee of the National Trust and presidency of the Youth Hostels association indicated other interests. Trevelyan became chancellor of Durham univ. 1950.

Trevelyan, SIR GEORGE OTTO (1838-1928). British politician and author. A nephew of Lord Macaulay, he was born at Rothley Temple, Leics, July 20, 1838, and educated at Harrow and Trinity College, Cambridge. He entered parliament in 1865 as Liberal M.P. for Tynemouth, afterwards



Sir George Trevelyan,
British politician

representing the Hawick Burghs, 1868-86, and a Glasgow division, 1886-97. Trevelyan began his official career as civil lord of the Admiralty in 1868, but resigned from that post in 1870, and soon became known as an advanced Radical. Secretary to the Admiralty in 1880, in 1882 he succeeded Lord Frederick Cavendish as chief secretary for Ireland. During 1884-85 he was chancellor of the duchy. In 1886 he succeeded to the baronetcy, and was secretary for Scotland during 1892-95. In 1897 he resigned his seat in parliament.

Long known as a scholar and a wit—a reputation enhanced by his humorous skit *The Ladies in Parliament*, published in 1867—Trevelyan's reputation as a writer rests on his excellent *Life and Letters of Lord Macaulay*, 1876. His *Early History of Charles James Fox*, 1880, shows an intimate knowledge of the great Whig and his times, but in *A History of the American Revolution*, 1909, he is perhaps on less sure ground. He died Aug. 17, 1928. A memoir by his son, G. M. Trevelyan (*v.s.*) appeared in 1932. His eldest son, Charles Philips (b. Oct. 28, 1870), was Liberal M.P. for Elland, 1899-1918, and Labour M.P. for Central Newcastle, 1922-31, being president of the board of Education in 1924 and during 1929-31. Another son, Robert Calverley (b. 1872), was a poet and translator of Greek and Latin verse.

Trevelyan, HILDA (b. 1879). British actress.

Born Feb. 4, 1879, her real name being Tucker, she was educated at the Ursuline convent, Upton, first appeared on the stage in 1889, and started on tour in 1894. Her first London appearance was in 1898. She took the part of Wendy in *Peter Pan* 1904, and in several revivals, and also



Hilda Trevelyan as
Wendy in *Peter Pan*

acted in Barrie's *The Little Minister*, Little Mary, *Alice-Sit-by-the-Fire*, *The Admirable Crichton*, *A Kiss for Cinderella*, and *Mary Rose*. She also scored a success in *Housemaster* by Ian Hay, 1936. She married Sydney Blow, author of *Lord Richard in the Pantry*, and other successful light comedies.

Trèves. French name of the German city of Trier (*q.v.*).

Treves, SIR FREDERICK (1853-1923). British surgeon. He was born at Dorchester, Feb. 15, 1853, and educated at Merchant Taylors'; was Hunterian professor of anatomy and Wilson professor of pathology at the Royal College of Surgeons, 1881-86, and examiner in surgery at Cambridge, 1881-96. During the S. African War, as consulting surgeon to the army, he served with the Ladysmith relief column. In 1902 he operated upon Edward VII and was made a baronet. A prolific writer, Treves published books of travel, including *Highways and Byways in Dorset*, 1906, and *The Country of the Ring and the Book*, 1913; war experiences and works on his own subject, *e.g.* *Surgical Applied Anatomy*, 1883; *System of Surgery*, 1895. He died Dec. 7, 1923.

Trevessa. British merchant ship which in June, 1923, sank suddenly in the Indian Ocean about halfway between Africa and Australia. The crew took to two open boats, one under the captain, Cecil Foster, the other under First Officer J. S. Smith. Despite severe suffering from exposure and limited supplies, these officers navigated the two boats safely to land, with the aid of compass and sextant only, the first reaching Rodriguez (1,556 m.) in 23 days, the second arriving at Mauritius (1,747 m.) in 25 days. Of 44 men in the boats, 11 died. Foster and Smith received a special presentation from the board of trade for their fine seamanship and resolution.

Trevethin, ALFRED TRISTRAM LAWRENCE, 1ST BARON (1843-1936). British judge. Born at Pontypool, Nov. 24, 1843, he was educated at Trinity College, Cambridge, and called to the bar in 1869, building up a large and varied practice. Junior counsel to the Admiralty, 1882, he became in 1885 recorder of Windsor, an office he held until his elevation to the bench in 1904, when he was knighted. He succeeded Reading as lord chief justice in 1921 and was made a baron, but resigned next year. He died Aug. 3, 1936, and was succeeded in the peerage by his son Charles (b. 1879).

Treviso (anc. Tarvisium). City of N.E. Italy, capital of the prov. of Treviso. It is a rly. junction 18 m. N. by W. of Venice at the confluence of the Sile and Botteniga. The cathedral of San Pietro, ornamented with five cupolas, was founded in 1141 and rebuilt in the 15th century; some of its frescoes by Titian and Paris Bordone, a native of the city, were damaged by bombs in the Second Great War. Other churches and medieval houses suffered more or less severely. The Borgo Cavour contains a large library and a picture gallery. Silks, woollens, metal goods, and machinery, chemicals, and paper are the principal manufactures. Treviso was an important city at the end of the Roman Empire, a member of the Lombard League, and subject to Venice in the 14th century. In the First Great War it was a base of the Italian army. Pop. 53,886.

Trevithick, RICHARD (1771–1833). British engineer and inventor of steam engines. Born at Illogan, Cornwall, April 13, 1771, he was trained as a mining engineer to assist his father. He made a study of the steam engine and quickly began to improve its method of working. In 1800 he invented



Richard Trevithick,
British engineer

a double-acting high-pressure engine, which came into wide use in the mining districts.

On Christmas Eve, 1801, a steam road carriage invented by Trevithick achieved the first passenger journey ever made by steam in England. His vehicles were seen in London in 1803, and next year he opened a steam railway for haulage at a mine in S. Wales. His fame was established in 1808, when he started a miniature public railway on a circular track at Euston Square, London. Trevithick applied steam to machines which he invented for boring and dredging; and amid general ridicule upheld the use of iron for boats and buoys. In 1812 he produced a steam threshing machine.

Invited to Peru to improve the engines used in the mines, he left England in 1816, and after six laborious and thankless years moved to Costa Rica, having lost all he possessed in the Peruvian war of independence. He came back to England in 1827, but his name had been forgotten; he was

refused a pension by parliament, and, though given employment by Robert Stephenson, he died in poverty at Dartford, April 22, 1833.

Trevithick remains a standing example of unappreciated genius. A brilliant mathematician and mechanic, but lacking the social graces, he surpassed Watt and anticipated Stephenson. It may be that he lacked application, trying to lay too many foundations. Of gigantic stature and strength, he was celebrated in Cornwall for wrestling. His life was written by his son, Francis, 1872; he is noticed in *Lives of the Engineers*, S. Smiles, new ed. 1904; consult also a study by H. W. Dickinson and A. Titley, 1934.

Triad (Gr. *trias*, group of three). Association of three kindred or correlated deities. In ancient Egypt, cycles of this type usually arose out of the association with the chief local god of other deities; in some instances the members were deemed to stand in the relationship of father, mother, and child. Such were the Theban triad of Amen, Mut, and Khons, the Memphite of Ptah, Sekhet, and Nefertum; and the Osiris-Isis-Horus triad which, in its Alexandrian form, comprised Serapis, Isis, and Harpocrates.

In Babylonia triads were derived from early conceptions of a cosmic trinity, such as Anu, Enlil, and Ea, representing sky, earth, and water; and Sin, Shamash, and Ishtar, representing moon, sun, and star. Early Aryan thought moved in the same direction in the Vedic triad of Agni, Indra, and Surya, representing fire, wind, and sun. Out of this emerged the Brahman Trimurti, or three aspects, portrayed as a three-headed image in a famous sculpture at Elephanta, and comprising Brahma the creator, Vishnu the preserver, and Siva the destroyer.

Buddhism adopted the principle in the Triratna, or three jewels, which were at first the Sangha or monastic order, portrayed as a man holding a lotus, the Buddha, and the Dharma or sacred law.

The Triad Society of China, denoting the union of heaven, earth, and man, arose in the 18th cent., becoming a powerful anti-dynastic movement. See Cave Temple.

Triad. In literature, a statement illustrated by three examples. Medieval Irish and Welsh collections exist, some being of historic interest; and there are good examples in Prov. 30. In music, the triad is the commonest chord, made up of tonic, third, and dominant, e.g. C. E. G., in key C.

Trial. In law, the examination of a cause, or a prisoner, before a judge, with or without a jury. The judge has jurisdiction to try the case according to the law of the land.

At common law in England trial by judge and jury is the normal method. The case is called on, and then the jury is empanelled; the parties, or the crown counsel, or the prisoner has the right to challenge anyone objected to for proper reasons. The counsel for the prosecution, or for the plaintiff, opens the case in a speech that is supposed to tell the jury what it is all about and what he proposes to prove. He then calls his witnesses. He examines the first witness, i.e. asks him questions in order to elicit the facts. The witness is cross-examined by the opposing counsel, who tries to elicit facts in favour of his client, and to show that the witness is unreliable. After cross-examination the prosecuting, or plaintiff's, counsel re-examines. He can ask questions only on points raised by the defendant's cross-examination.

After all the witnesses on this side have been called, the defending counsel opens his case and calls his witnesses, who are examined, cross-examined, and re-examined. Then the defending counsel sums up in a speech, and after that the prosecuting, or plaintiff's, counsel replies on the whole case. If the defending counsel has put in no other evidence than that of the accused, he is normally entitled to make the closing speech. The judge sums up. He ought to tell the jury what issues to direct their minds to, to call their attention to the evidence on all these issues; and he may or may not, in his discretion, express an opinion on any of the evidence given. After the summing-up the jury give their verdict, and then the judge gives judgement on their findings. Questions of fact are for the jury to decide, and questions of law are for the judge alone.

In civil cases trial may in general also be by jury, although cases are more frequently tried by a judge alone. In the king's bench division there is a right to trial by jury in cases of fraud or libel unless the judge considers the case unsuitable. In the probate and divorce division trials are occasionally by a jury; but in chancery they are almost without exception by a judge alone. So are most actions in the county court. Alternative methods of trial are by a judge with assessors—e.g. in Admiralty actions—or by an official referee. See Auto-da-fé; Evidence; Ordeal.

Trial by Battle. Ancient form of trial. In it the parties in a civil case or appeal of felony could decide the action by personal combat. In the first case men were usually hired to fight the duel, but in cases of felony or murder accuser and accused fought personally until one was slain. If the accused gave in, he was put to death; if he killed his opponent or the fight lasted from sunrise to sunset, he was acquitted. Introduced into England by the Normans, trial by battle, abolished 1818, was last waged in the court of common pleas, Westminster, 1571; in the court of chivalry, 1631; and in the court of Durham, 1639. *See* Ordeal.

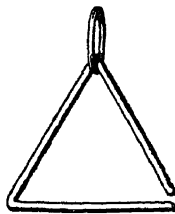
Trial by Jury. Operetta by Gilbert and Sullivan. Produced March 25, 1875, at the Royalty Theatre, London, it ran for 128 performances, and was one of the early pieces in which they collaborated. It presented a burlesque trial for breach of promise, culminating in the proposal of the judge to marry the plaintiff.

Triangle (Lat. *tres*, three; *angulus*, angle). Plane figure bounded by three straight lines or sides. Any of the angles formed by the sides may be regarded as the vertex; the side opposite it is then called the base. The height or altitude of a triangle is the length of the perpendicular drawn from a vertex to the base or the base produced. An equilateral triangle has three equal sides, and hence three equal angles (each 60°); an isosceles triangle has two equal sides, the angles opposite to them being equal; in a scalene triangle, all sides are unequal. An acute-angled triangle has each angle less than 90° ; a right-angled triangle has one angle 90° ; an obtuse-angled triangle has one angle greater than 90° . The area of a triangle is half the base multiplied by the height. In a right-angled triangle the side opposite the right angle is called the hypotenuse, and the square on it is equal to the sum of the squares on the other two sides (Pythagoras's theorem). Similar triangles are those with the same shape; congruent triangles, those with identical shape and size.

A spherical triangle is a portion of the surface of a sphere bounded by three arcs of great circles. Its properties differ in many ways from those of plane triangles. The triangle of forces is a conception of mechanics: if three forces acting at a point can be represented in magnitude and direction by the sides of a triangle taken in order,

the forces will be in equilibrium. Triangulation is a process used by surveyors for accurate mapping of areas. *See* Geometry; Surveying; Trigonometry.

Triangle. In music, a percussion instrument. It is a steel rod bent into triangular shape, with one open angle. Suspended by a cord, it is struck by another small steel rod of spindle form so as to allow of heavier or lighter strokes, as desired. Possessing a bright and silvery



Triangle used in bands and orchestras

tone, it is useful for rhythmical effects, and is in general use in military bands.

Triangulum. In astronomy, small, inconspicuous constellation between Perseus and Andromeda. Its brightest star is of the third magnitude, and it contains a number of double and variable stars and the nebula Messier 33.

Triangulum Australe. In astronomy, southern constellation placed by Bayer on the edge of the Milky Way. Its three principal stars make a diamond with Alpha Centauri. Its brightest star is of the second magnitude, and the constellation contains short-period variable and double stars.

Trianon. Buildings in the park of the palace of Versailles (*q.v.*). The Grand Trianon is a long, single-storey building built by Hardouin-Mansart on the site of a smaller pleasure-house erected in 1662. It was built in 1687, and a wing was added in 1703. It contains interesting pictures, chiefly of the French 18th century schools. The Petit Trianon lies a little to the E. Originally built, 1762-68, by Louis XV, for Madame Dubarry, it was presented by Louis XVI in 1774 to Marie Antoinette, who here established a miniature country village and farm. At the Grand Trianon on June 4, 1920, the treaty between Hungary and the Allies was signed.

Triassic. In geology, a system of rocks laid down after the Permian and before the Jurassic, i.e. between 150 and 200 million years old. The name was derived from the fact that in Europe the rocks of the system could be divided into three main groups: the Bunter, Muschelkalk, and Keuper, in ascending order. In Great Britain the Muschelkalk is not represented. Triassic sedi-

ments are characteristically red, and were formed under desert conditions, continuing those which began in the Permian period. In England they are found in Cumberland, surrounding the N. edge of the Lake District; in W. and S. Lancs, and thence into the Midlands. In Yorkshire they lie E. of the Pennines and join with the Lancashire beds to form the great undulating plain of the Midlands. Further deposits occur in Glos, the Mendips, and on to the S. coast. The Bunter beds are made up of sandstone and pebbles. The Muschelkalk in Germany is of marine origin, and contains limestones and dolomites. Above it lies the Keuper, which in Great Britain consists of a lower sandstone overlain by red or red and green mottled marls. The rocks carry gypsum and rock salt in important quantities in Cheshire. Some of the sandstones have been used for building, e.g. Hereford cathedral; and at Mansfield Bunter sands are dug for moulding. Many sandy horizons in the Triassic are water-bearing, and the system forms an important source of underground water.

During the Triassic period cycads, conifers, and gigantic equisetums flourished, amphibian labyrinthodonts were common, and ichthyosaurs, dinosaurs, crocodiles, and plesiosaurs among reptiles were numerous. The earliest mammal remains come from rocks of this period.

Tribe. Social group having a common speech, cultural level, and body of customs, occupying a circumscribed food-producing area, and claiming a common ancestry. As thus used in ethnology the term denotes the simplest social political unit, based on endogamy, marriage outside the tribe being discouraged, but often comprising two or more exogamous phratries or clans.

Government is effected by means of tribal or customary law, maintained either by public opinion expressed through the elders, or by headship, elective or hereditary. Among the Australian aborigines, whose physical environment offered no incentive to the development of warfare, tribal cohesion was maintained by the initiation ceremonies and other periodic gatherings. In aboriginal America the tribal organization passed through every stage, from the simplest (Fuegians) to such complex unions as the Iroquois confederacy. Negro and Bantu Africa are essentially tribal. No-

madism usually leads to tribal autocracy. See Ethnology; Race; Society.

Tribromethanol. Substance originally introduced into medicine as a surgical anaesthetic to be administered by rectal injection. Now mainly used as a basal narcotic. See Anaesthesia; Bromethol.

Tribunal. Literally, the place in Rome where the tribunes sat to discharge their official duties. It has therefore come to mean any place where judges and others sit to administer justice. During both Great Wars the name was given to the bodies set up to hear claims for exemption from military service. Another phrase of wide currency was international tribunal, in connexion with the trials of war criminals in 1945-46.

Tribunal of Inquiry. Body which can be set up under the Tribunals of Inquiry (Evidence) Act, 1921. Such a tribunal was intended to inquire into a matter of urgent public importance on the passage of a resolution by both houses of parliament. It can compel witnesses to attend and give evidence on oath, and insist on the production of documents. Possible divulgence of information about the budget, 1936, was inquired into by such a tribunal, as were allegations in 1948 of irregularities at the board of trade.

Tribune (Lat. *tribunus*). Title of various military and civil officers of ancient Rome. Military tribunes were originally commanders of the tribes. Six were appointed for each legion, being all elected from 207 B.C. by vote of the people. When more than two armies took the field, those which were not commanded by consuls were placed under military tribunes with consular power. Tribunes of the treasury (*tribuni aerarii*) were paymasters of the army.

More important were the tribunes of the people or plebs. When Rome established the republic in 509 B.C., the plebeians shared in the *comitia centuriata*, or national assembly, but the magistracies, the high offices of state, were confined to the patricians. In 494 the plebeians obtained the right to appoint from among themselves two tribunes authorised to intervene for the protection of plebeians against arbitrary action on the part of the magistrates. The numbers were raised to five and then in 457 to ten. In 287 the exclusively plebeian assembly, the *comitia tributa*, became an independent legislative body, while

the tribunes individually had the power of initiating legislation, of imposing a veto upon the enactment of proposed laws, and of prohibiting administrative acts on the part of the magistrates.

The latent powers of the tribunate were suddenly developed when Tiberius Gracchus was elected tribune in 133. Hitherto democratic legislation had been held in check because the senate could always count on procuring one tribune willing to impose his veto upon obnoxious proposals. But Gracchus formally deposed an antagonistic tribune by the vote of the *comitia tributa*. Sulla's legislation in 81 temporarily deprived the tribunate of some of its powers, which were again partially restored in 75 and 70. See Augustus.

Tribune, THE. Former London daily Liberal newspaper. It was founded by Franklin Thomasson, Jan. 15, 1906, a paper of 16 seven-column pages, with William Hill as managing editor and L. T. Hobhouse as assistant editor. It ceased to appear, Feb. 7, 1908, having involved a loss of £200,000. Its brief but interesting career is understood to have inspired Sir Philip Gibbs's novel, *The Street of Adventure*, 1909. Another Tribune, a left-wing weekly, was founded in 1937 by Sir Stafford Cripps, Aneurin Bevan, G. R. Strauss, and Ellen Wilkinson.

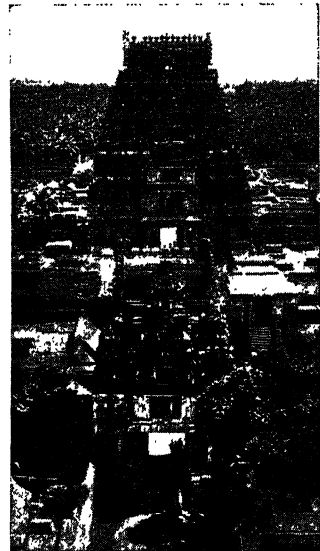
Triceratops (Gr. *treis*, three; *keras*, horn; *ops*, face). Fossil horned dinosaur. One of the most remarkable of the giant fossil reptiles, the triceratops flourished in the Cretaceous epoch, and skeletons have been found in deposits of that period in N. America. It had a skull over six ft. in length, and the total length of the animal was 25 ft. It had three horns, a small one on the nose, and two just above the eye-sockets. Triceratops was herbivorous, and in proportion to its size had the smallest brain of any other vertebrate of the time. Its heavily built legs were supported on three large toes. See Dinosaur.

Trichiasis. Turning inwards of the eyelashes, which thus cause irritation to the cornea. Treatment consists in destroying the ingrowing eyelashes by electrolysis where they are few in number, or in more serious cases operation upon the eyelid to turn the eyelashes in their proper direction. See Eye.

Trichina. Genus of Nematoda or threadworms. *Trichina spiralis* is one of the most dangerous

parasites in man and other animals. It is less than a sixth of an inch long, and some millions may be present in one host, in which case they give rise to the disease known as trichiniasis. The eggs are hatched out in the intestines of the host, and the trichinae then migrate to the muscles, where they become encysted and develop no further unless the flesh of the host is eaten by some other animal. They are then set free in the alimentary canal, where they become sexually mature. The natural host of this parasite is the rat, but it is often found in pigs. See Cestodes.

Trichinopoly. Dist. and city of Madras state, India, lying mainly N. of the Cauvery. Here



Trichinopoly, India. One of the great temples for which the town, a pilgrimage centre, is famed

the ancient system of irrigation was used by engineers of the E. India co. as the basis of the first irrigation canals in India. Rice, millet, oilseeds, and tobacco are the chief crops, and Trichinopoly has given its name to a form of cheroot. The district came into British possession when the Carnatic was taken in 1801. The city, properly called Tirusirapalli (city of the three-headed demon), is famous for its three rocks, and for temples which make it a great place of pilgrimage. It is also the h.q. of Christian missionary effort. Bishop Heber is buried in S. John's church, and the missionary college is called after him. Christ Church was the first English place of

worship founded in India (1765), and there is also an R.C. cathedral. S. Joseph's College, founded by the Jesuits in 1844, was transferred from Negatapattam to Trichinopoly in 1883, and is part of Madras university. Area, dist., 4,329 sq. m. Pop., dist., 2,244,543; city, 159,566.

Trick (Old Fr. *trichier*, to beguile). Primarily, a fraud or deceit; by extension, a contrivance intended to puzzle and amuse people. In card games a unit of cards, e.g. four in bridge and whist, won by a player is known as a trick. (See Bridge; Puzzle; Three-card Trick: Whist.)

In heraldry, a trick is a coat of arms roughly drawn with figures and letters to denote numbers and colours. This is said to be trick or "tricked" and is a method adopted by heralds, heraldic painters, and students for purposes of record.

Tricolor. Term generally applied to the blue, white, and red national flag of France. It originated in the early days of the 1789 Revolution, and was a blending of the colours of the national guard of Paris, who bore cockades of the city colours, red and blue, and of the royalist troops, who bore white cockades. These were grouped in a flag of three perpendicular stripes of equal width, the white being placed between the blue (against the pole) and the red. Though for a time eclipsed by the red ensign of the Commune, it was finally adopted as the national flag, and, under Napoleon, led the republican and then the imperial troops to victory. Louis XVIII and Charles X replaced it by the Bourbon white flag with its three golden fleurs-de-lis, but with Louis Philippe the tricolor came back, and has never since been abandoned. For other tricolors adopted by nations, see Flag colour plate.

Tricuspid Valve. Valve between the right auricle and right ventricle. See Heart.

Tricycle. Vehicle having three wheels. It originated as a pedal-propelled cycle and was introduced in 1878. Most pedal tricycles are steered directly by one

wheel in front, though some have two steering wheels in front and a single pedalled wheel behind. The pedal variety is seldom used except when fitted with a box body for delivery of goods, or equipped as an invalid chair, in which form it is driven by cranks operated by hand-levers.

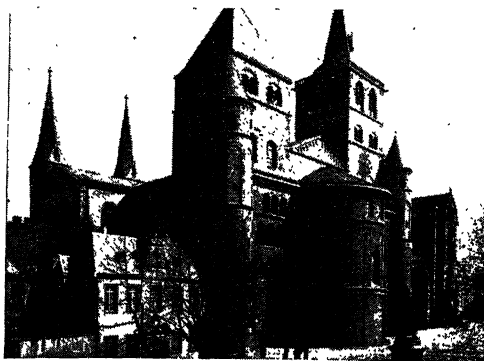
Tricycle motor cars normally have two steerable wheels in front, and one at the rear, but transmission from the engine may be to either the front or rear. Some aircraft have tricycle undercarriages, the third wheel being fitted to the nose instead of below the tail. The advantage of this is that when on the ground the fuselage is horizontal, instead of sloping to the rear.

Trident. In Greek mythology, the three-pronged spear which Poseidon (the Roman Neptune), god of the sea, bore as the symbol of his sovereignty. It has come to be generally regarded as the emblem of sea power, and as such is carried by Britannia (*q.v.*).

In gladiatorial combats in ancient Rome, the trident was used by the class of gladiators called *retiarii*. These fought with a net, with which they endeavoured to entangle their opponent, the trident being used to dispatch him after he had been so entangled. See Neptune.

Tridymite (Gr. *tridymos*, three-fold). A form of the mineral silicon dioxide. Stable between 870° and 147° C. at atmospheric pressures, it differs from the usual form of quartz in having a lower specific gravity and in its atomic structure and crystalline form. The mineral is found chiefly in acidic volcanic rocks.

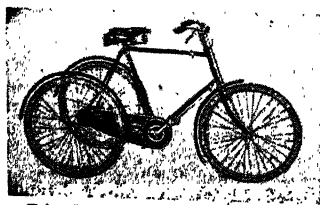
Triennial Act. There have been in English history two Acts bearing this name, both dealing with the duration of parliament. In 1641 the Long Parliament passed an Act declaring that more than three years must not elapse without the houses being called. The second Triennial Act, passed in 1694, fulfilled a very different purpose, ordaining that no parliament should last longer than three years. The second Act was virtually repealed by the Septennial Act of 1716.



Trier, Germany. Cathedral of SS. Peter and Helena, which was laid in ruins during the Second Great War

Trier (Fr. *Trèves*). City of the Rhineland. One of the oldest and, once, most important towns of Europe, it lies on the right bank of the Moselle, 65 m. S.W. of Coblenz. Built 15 A.D. by Augustus as Augusta Treverorum at the sanctuary of the Celto-Germanic Treveri tribe, Trier (*Trèves*) became the capital of Belgica I, c. 250, of all Gaul towards 300, holding that rank until 414. Its bishopric, allegedly dating from the first cent., was promoted to an archbishopric by Charlemagne, 811. The period of its greatest power was the 13th cent., when its archbishops, ruling over about 3,300 sq. m., were second in rank among the German Electors, a sovereign rank they held until 1803. French until 1814, most of the electorate then fell to Prussia. Trier was occupied by first U.S., then French, forces, Dec. 1, 1918, to June 30, 1930.

During the Second Great War, Trier was captured March 2, 1945, by Gen. Patton's 3rd U.S. army after ineffective resistance by the *Volkssturm* (*q.v.*) of the city, the German army having retreated eastward. The city was found two-thirds destroyed. The Roman amphitheatre and baths were badly damaged. The cathedral, oldest in Germany, was in ruins: in Romance style, and dating back to the 4th cent., with reconstructions and additions of the 6th, 11th, and later cents., it had some fine old sculpture and sheltered the Holy Coat (*q.v.*) and many other relics. The churches of S. Matthew (12th cent.), S. Gangolphus (15th), S. Paulinus (1734), and S. Gervasius (1765-68); the Holy Cross chapel (1050); the electoral palace (1756-61) incorporating parts of a 4th cent. building; the rich town library (17th cent.) were others of Trier's beautiful buildings. Trier's industries included iron foundries,



Tricycle. Modern form of a machine first introduced about 1878

tobacco, leather, and glass manufactures; it was a centre of the wine trade. Pop. (1935) 76,692. After the surrender of Germany in 1945 Trieste came within the French zone of occupation.

Trieste. Seaport on the Adriatic, at the head of a gulf of the same name. Picturesquely situated around a



Trieste arms

320-ft. hill crowned by an old castle and bearing the cathedral of S. Giusto (11th to 14th cents.) built upon the remains of a Roman temple, the old city consists of narrow, winding, colourful streets; the new, round the harbour, of avenues with palatial buildings, town hall, shipping offices, etc. The Grand Canal runs from the old harbour to the (modern) Greek church of S. Antonio; other buildings, especially churches of several oriental rites, emphasise the cosmopolitan nature of this ancient and important trading city, e.g., the Jesuit church S. Maria Maggiore (1627-82) and the Orthodox church of S. Nicolo (1786). The Carciotti palace (1800) is a fine building. There is a university specialising in economics, and high schools of shipping and navigation, of pedagogy and music, theatres, libraries, and museums.

Remnants of Trieste's Roman past are preserved; the Arch of Ricardo, near the public gardens, dates back to 200. Shipbuilding, oil- and soap-making, jute, pot-

tery, and liquor factories, engineering, and stone industries flourished in the past, but international trading and shipping were the backbone of Trieste's economic life for many centuries. Some of Italy's principal shipping lines had their h.q. in Trieste between the two Great Wars—e.g. Lloyd Triestino, Cosulich, Navigazione Libera Triestina. The port, originally with 6 jetties, was expanded after 1867 to take the biggest vessels. In 1938 imports reached 930,914 tons in 3,165 ships; exports 654,189 tons in 3,159 ships; in 1946 imports were 1,447,773 tons in 1,302 ships, exports 45,109 tons in 1,290 ships.

HISTORY. Trieste existed in pre-Christian days as Artemidorus. Under Augustus it was called Tergeste, became a Roman colony and gained moderate importance, as shown by architectural and other remains. It came under the rule of bishops at the beginning of the 10th cent., but was made a republic at the end of the 13th; unable to compete with Venice, it accepted Duke Leopold III of Austria's rule in 1382, and soon became a trading and shipping centre for the Hapsburg dominions. Made a free port by the Emperor Charles VI in 1719, except for its occupation by Napoleon, 1809-14, it remained Austria-Hungary's chief outlet to the sea until 1918. It was made a free city of the empire 1849, a *Land* of the Austrian crown 1867. The free port was abolished 1891.

After the unification of Italy a strong irredentist movement developed in Trieste, to secure which became one of the chief aims of Italy during the First Great War;

the Isonzo (*q.v.*) battles were directed towards that goal.

Occupied by Allied forces Oct. 31, 1918, Trieste fell to Italy by the St. Germain treaty (*q.v.*), 1919. The composition of its pop. justified that transfer: the Austrian census of 1910 showed it to consist then of 95,583 of Italian speech; 21,672 of Slav speech; 9,255 of German speech. But Yugoslavia

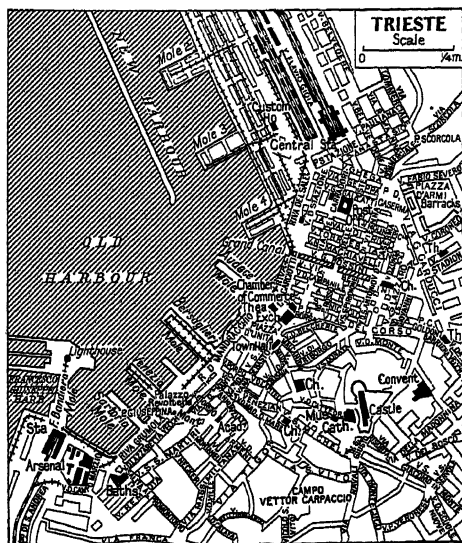
had claimed, and continued to covet, this great port. The Germans in Trieste during the Second Great War surrendered to Lt.-Gen. Freyberg on May 2, 1945. When New Zealand troops entered the city next day, however, they found already in it, besides Italian guerrillas, Yugoslav forces, both Tito's and Chetnik bands, who had occupied positions previously evacuated by the Germans; and Yugoslavia claimed the city by right of conquest. After discus-

sions between British and U.S. representatives and the delegates of Marshal Tito in Belgrade and Washington, an agreement for the temporary military administration of Istria was reached under which Trieste, with the rlys. (some 84 m.) and roads connecting it with Austria, came under the supreme Allied command; a force of regular Yugoslav troops was to be allotted a district of occupation by the supreme commander; Yugoslav forces in the area to come under Allied military govt. were to be withdrawn by 8 a.m. on June 12. This was effected without incident. The city escaped war damage.

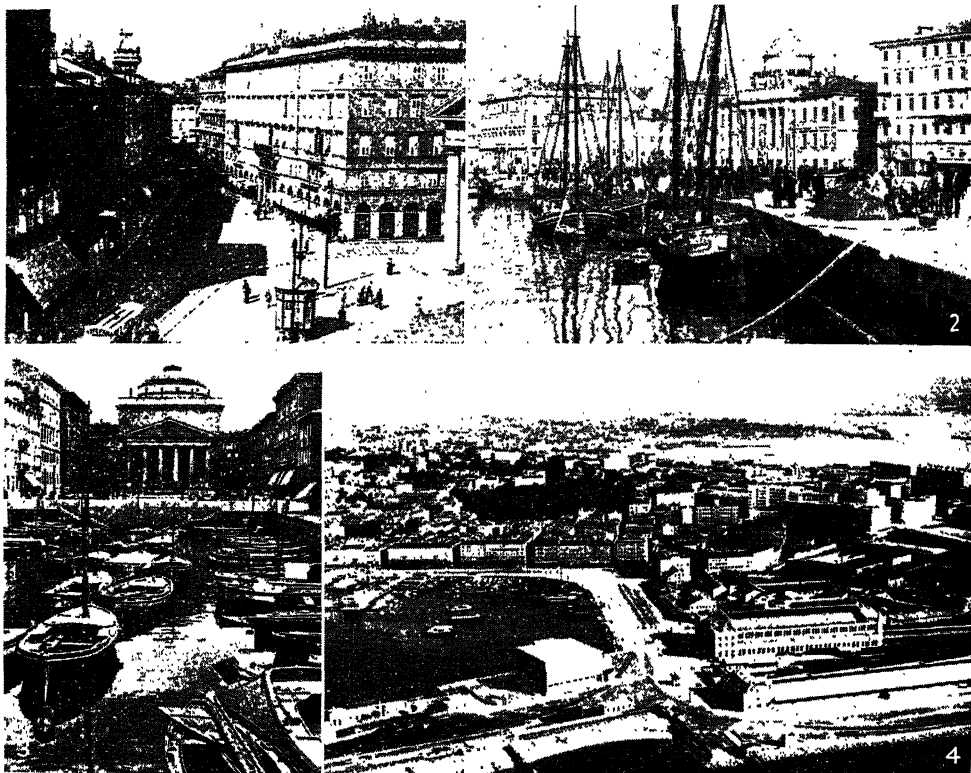
Under the peace treaty with Italy, 1947, Trieste with a stretch of country behind it from Duino on the N. to Cittanuova on the S., measuring in all c. 320 sq. m., was to be constituted a demilitarised free territory under a governor to be appointed by the United Nations. Failure of the U.N. to agree on the choice of a governor led the U.S.A., the U.K., and France to propose to Russia, March 20, 1948, that Trieste should be returned to Italian sovereignty. This proposal was rejected by Russia, and military occupation by 5,000 British, 5,000 U.S., and 5,000 Yugoslav troops continued, the Yugoslav zone being virtually incorporated



Trieste. The broken line shows 1939 frontiers; the area within the unbroken line it was proposed in 1947 to place under U.N. administration



Trieste. Plan of the Adriatic seaport



Trieste. 1. The Corso, principal thoroughfare, which runs between the old and new towns. 2. The quay. 3. The Grand Canal and the church of S. Antonio. 4. Air view of the port

in Yugoslavia. Pop. of the city in 1947 was 270,012, of whom more than 200,000 were Italian speaking; pop. of the Anglo-U.S. zone of the free territory, 300,000.

Triforium. In ecclesiastical architecture, an upper storey over the aisle of a cathedral or large church with a series of openings into the nave immediately above the crowns of the nave arcade. These openings were arcaded, and in Norman and E.E. work were of considerable height. In the Christian basilica the triforium accommodated women. Noteworthy examples in English ecclesiastical buildings are at

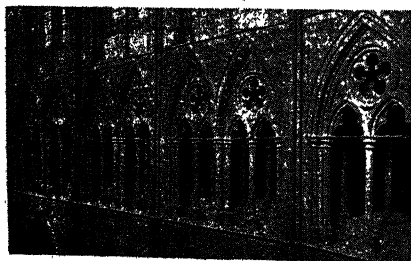
Westminster abbey and Peterborough cathedral. *See* Architecture; Blind Storey; Cathedral.

Trigeminal Nerve. Fifth of the cranial nerves which spring from the brain. The roots of the nerve pass into an enlargement, the Gasserian ganglion, from which three main branches of the nerve are given off: (1) the ophthalmic nerve; (2) the superior maxillary nerve; (3) the inferior maxillary nerve. The first two divisions of the trigeminal nerve are purely sensory; the third is partially sensory and partially motor.

Tic douloureux or neuralgia of the trigeminal nerve is a very severe form of neuralgia, probably due to an affection of the Gasserian ganglion. The condition generally begins after middle life, with sudden paroxysms of violent pain which may last a few seconds or a minute. The muscles of the face become contracted and the pain is intense. The paroxysms may follow each other for a few hours, and then

remission may occur for days or even months. Gradually the periods of remission become shorter, and the patient may never be entirely free from pain. Treatment consists at first in building up the general bodily health and removing all causes of reflex irritation, such as carious teeth. Aspirin or morphia may be given to relieve the pain when the attacks occur. Applications of chloroform liniment, camphor, or menthol may be helpful, but the only cure may be to cut the trigeminal nerve or destroy the Gasserian ganglion. *See* Nerve.

Trigger. Device on a firearm or on an artillery piece of 20-mm. calibre to release the firing-pin to strike the cartridge and so detonate the propellant charge of the missile. In revolvers, rifles, and automatic weapons of .303 calibre, the trigger is a lever placed beneath the lock and protected by a curved piece of metal. Pressure on the trigger by the forefinger actuates a lever (the sear), disengaging it from the bent of the firing-pin and allowing the latter to spring forward. In single-shot weapons the trigger must be



Triforium above the north transept of Westminster Abbey, a fine example of Gothic tracery

squeezed for each shot fired; in automatics a continued single pressure on the trigger will discharge every round in the magazine. On hammer-fired pistols and shot-guns the trigger is in direct contact with the hammer when the piece is cocked, and pressure on the trigger drives the hammer forward against the cartridge. In artillery pieces the trigger generally takes the form of a grip lever which, when squeezed by the hand, operates a cable, which disengages the sear and bent on the lock. *See Rifle.*

Triglyph (Gr. *treis*, three; *glyphē*, carving). In classic architecture, an ornament of the Doric frieze, consisting of a block grooved into three vertical sections and chamfered on the outside edges. One is placed over each column and, in the simple form, one between the columns. *See Doric Order; Frieze; Greek Art and Architecture.*

Trigon. Ancient triangular harp. Probably of Assyrian origin, it was adopted by the Egyptians, who frequently represented it in their mural paintings. The wooden frame often had only two sides, the third being formed by the longest string. The instrument was placed under the arm or upon the shoulder when played. It was in use as late as the days of Pompeii. *See Harp.*

Trigonometry (Gr. *trigōnon*, triangle; *metron*, measure). Branch of mathematics concerned with the measurement of plane and spherical triangles.

From this are evolved the calculations of their angles and areas, together with other qualities related to these. Any plane triangle can be divided into right-angled triangles; and the ratios between the sides of right-angled triangles depend only on the acute angles of such triangles. Ultimately, therefore, trigonometry is resolved into the measurement, tabulation, and classification of these functions of the magnitudes of angles.

The figure shows how the trigonometrical ratios of an angle are defined. XOX^1 , YOY^1 , are lines at right angles, P, P¹, etc., any point on the circumference of a circle having O as centre. PM is perpendicular to X^1OX . Then, if

the angle XOP is called θ , the *sine* of θ is PM/OP; the *cosine*, OM/OP; the *tangent*, PM/OM. The reciprocals of these ratios are known as the cosecant, secant, and cotangent respectively. With the usual convention of signs in Cartesian coordinates, the sine of an angle in the first and second quadrants is positive and negative in the third and fourth quadrants, the cosine positive in the first and fourth quadrants and negative in the second and third, and the tangent positive in the first and third quadrants and negative in the other two.

The sum of the squares of the sine and cosine of an angle is equal to unity. If A, B, are any two angles, then

$$\sin(A+B) = \sin A \cos B + \sin B \cos A;$$

$$\cos(A+B) = \cos A \cos B - \sin A \sin B.$$

The chief triangle formulae of trigonometry are, if A, B, C are the angles of the triangle, and a, b, c the sides,

$$a/\sin A = b/\sin B = c/\sin C;$$

$$\cos A = (b^2 + c^2 - a^2)/2bc, \text{ etc.}$$

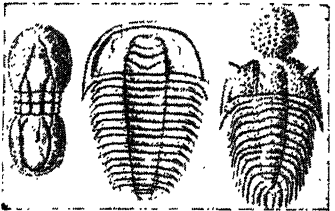
Among the earliest mathematical astronomers, Hipparchus constructed a table of chords of arcs of the circle, which is practically the same as that of natural sines, and he was followed by Hero of Alexandria. The work of Hipparchus was reconstituted by Ptolemy, who in his first book treated of trigonometry, plane and spherical, and gave a table of chords or natural sines which may be identical with that of Hipparchus. *See Logarithms; Sine; Symbols. Consult Trigonometry, A. W. Siddons and R. T. Hughes, 1928.*

Trilby. Novel by George Du Maurier, first published serially in Harper's Magazine, 1894. It is a discursive, sentimental romance, set among the ateliers of Paris, the heroine, Trilby O'Farrell, being an artists' model, and the hero, "Little Billee" Bagot, an art student. The villain is Svengali (*q.v.*), under whose evil hypnotic influence Trilby is turned into a famous singer. Not least of the work's attractions were the author's own illustrations. The plot was based on a story heard by Du Maurier in Paris, but the title was used earlier by Charles Nodier and Alfred De Musset. A dramatised version of Trilby, by Paul Potter, was first produced at The Haymarket, London, Oct. 30, 1895, Tree playing the part of Svengali and Dorothea Baird that of the heroine. For many years from 1920 Phyllis Neilson-Terry excelled in the latter rôle.

Trilithon (Gr., triple stone). Megalithic structure comprising a horizontal lintel supported by two uprights. There are five at Stonehenge (*q.v.*).

Trill (Ital. *trillo*). Literally, a shake or tremulous vibration. In music the term is used for an ornament, also called a shake (*q.v.*).

Trilobites (Gr. *treis*, three; *lobos*, lobe). Group of fossil marine animals belonging to a sub-class



Trilobites. Examples from the Cambrian system (left to right): Hypoparia, Agnostus princeps; Opisthoparia, Olenus cataractes; and Proparia, Stauropetalus Murchisoni. By courtesy of the Trustees, British Museum.

of Crustacea. The animals were extremely numerous in the Cambrian, Silurian, and Devonian periods; during the Carboniferous they disappeared. Trilobites were covered with a hard shell, oval in shape, and divided by two dorsal furrows into three longitudinal lobes, a mesial and two lateral, which occasioned the name. The shell was also divided into three parts transversely, a head shield, a body or thoracic shield, and a tail shield or pygidium. The head was semicircular, with a central protuberance, the glabella. The animal possessed lateral or compound and median or parietal eyes, and many were capable of rolling themselves up so that the soft lower parts of their bodies were protected from attack, a position in which many fossils are found. During the Cambrian, trilobites were the chief forms of life, but very little is known of their habits, save that they inhabited the sea bottom. Over 2,000 species have been found, of all sizes up to 2 ft. long.

Trilogy. Term originally employed to denote a series of three separate plays on one continuing theme. A classic example is found in the Agamemnon, Choephoroi, and Eumenides of Aeschylus; Shakespeare's three parts of Henry VI may be regarded as a trilogy; as also may Schiller's Piccolomini, Wallenstein's Camp, and Wallenstein's Death; and Swinburne's Chastelard, Bothwell, and Mary Stuart. The word has come to be used of novels and other works in which a writer has given a con-

tinuity of theme to three separate books, as Galsworthy did twice with his Forsyte novels, and G. M. Trevelyan with his studies of Garibaldi and of England under Queen Anne.

Trim. Urb. dist. and co. town of Meath, Eire. Standing on the Boyne, 30 m. N.W. of Dublin, on



Trim, Eire. Ruined walls and keep of King John's Castle, seen from the Boyne

the Eire State rlys., it is the centre of an agricultural dist. It was an important town in the 15th century and was also the site of an early bishopric. King John's castle, now in ruins, was originally built by Hugh de Lacy in 1173. Sir John Talbot, lord lieutenant in 1415, erected Talbot's castle, remains of which still stand. A Norman tower marks the site of S. Patrick's abbey of S. Mary near by. The ruins of the great abbey of SS. Peter and Paul extend on both sides of the river. Trim was incorporated under Edward III. Its town hall and other buildings were burnt in the disturbances of 1920. Market day, Sat. Pop. 1,455.

Trim, CORPORAL. Character in Sterne's novel, *Tristram Shandy* (*q.v.*). He is manservant to Uncle Toby, whose orderly he had been in the army in Flanders, and is a skilfully drawn portrait of the old soldier, loquacious but respectful, his master's trusted companion.

Trimeter. In English verse, a line containing three feet or stresses. It is not commonly found throughout a poem, though by its use great strength can be expressed; a fine example is Nashe's *In Time of Pestilence*, and a popular one Byron's *Vision of Belshazzar*. Bridges was fond of the measure and Cecil Day Lewis used it effectively.

Trimethylamine (C_3H_9N). Colourless liquefiable gas with a penetrating fishy odour. It forms salts by direct combination with acids, like ammonia. It is prepared on a large scale from the vinasses or residues obtained in refining beet sugar. Trimethylamine has several technical applications.

Trimmer. Term applied to vacillating politicians, the allusion being to one who trims his sails to catch every favouring breeze. It was coined by the marquess of Halifax (1633-95), who in a work entitled *The Character of a Trimmer*, 1684, ably defended his policy as being well balanced and moderate. Mommsen in his *History of Rome* applied the term to Cicero. See Halifax, Marquess of.

Trimmer. In building, a joist or beam which trims an opening and supports the ends of trimmed joists or rafters. It is used in forming an opening in a floor or roof,

particularly a hearth opening in a timber floor, a staircase well, or a roof light in a pitched or flat roof. The trimmer may be of timber, steel, or reinforced concrete. It must be heavier than the members it supports. In timber floors the trimmer joist to a hearth or a staircase well is usually joined to heavy trimming joists, which run at right angles to it. One end of the trimmer is sometimes supported on a wall. The joists are usually housed to the trimmer. In timber roofs the trimmed opening for a light is formed similarly, though the timbers are lighter.

A trimmer arch is a brick arch under an upstairs hearth; it spans between chimney breast and trimmer joist, supporting the hearth.

Trincomalee. Seaport on the N.E. coast of Ceylon, 99 m. N.E. of Kandy. It is built on a peninsula separating the outer from the inner harbour in the Bay of Trincomalee. The inner harbour is about 4 sq. m. in area and deep enough to take the biggest ships. Long the h.q. of the E. India squadron, it was later used only as an oil depot and subsidiary base to Singapore. While Singapore was in Japanese hands, 1942-45, Trincomalee again became a British naval base. It was heavily bombed by Japanese carrier-borne aircraft on April 9, 1942. The ships in port when the attacking force was sighted put to sea; three, the 10,000-ton cruisers *Dorsetshire*, completed 1929, which sank the *Bismarck* (*q.v.*), and *Cornwall*, completed 1927, which sank the German raider *Pinguin* in the Indian Ocean in 1941, and the 10,500-ton aircraft carrier *Hermes*

(*q.v.*) were sunk by air attack some 10 m. off shore; a large proportion of the crews was saved.

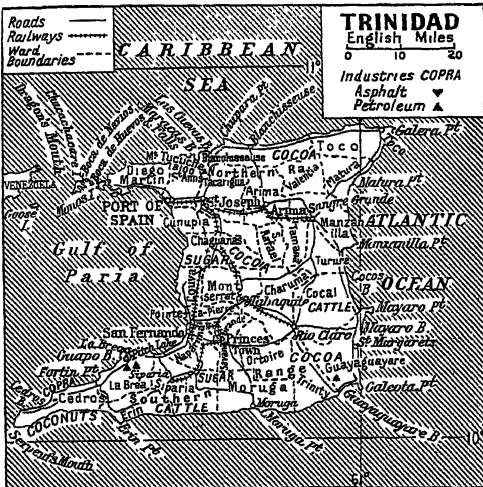
Trincomalee was one of the earliest settlements of the Tamils in Ceylon. They built the temple of a thousand columns, dedicated to Konatha, which was destroyed by the Portuguese, who took the port in 1622 and put up their own Fort Frederick, which still stands. The old Tamil temple is still remembered by a weekly ceremony at which a Brahman throws offerings into the sea from the top of the rock on which the temple stood. Subsequent possessors after the Dutch ejected the Portuguese in 1639 were the French (1673), Dutch (1674), English (Jan., 1782), French (Aug., 1782), Dutch (1783), English (1795). Into Trincomalee Bay flows the Mahaweliganga, biggest river of Ceylon. Pop. 20,000.

Trine, RALPH WALDO (b. 1866). American author. Born at Mount Morris, Ill., Sept. 9, 1866, and educated at Wisconsin and Johns Hopkins universities, he was successively a teacher, lecturer, bank cashier, newspaper correspondent, and fruit grower. Deeply interested in ethical and social subjects, he was director of the American Humane Education Society, and the author of *In Tune with the Infinite*, 1898; *The Land of Living Men*, 1910; *The New Alinement of Life*, 1913; *My Philosophy and My Religion*, 1921; and many other books on ethical and religious matters.

Tring. Market town and urban dist. of Herts, England. It is 32 m. by rly. N.W. of London, and is also on the Grand Union Canal. It stands at the base of the Chiltern Hills. The chief building is the Perp. church of SS. Peter and Paul. There is a trade in agricultural produce. The museum, founded by Lord Rothschild, was taken over by the trustees of the British museum. Pop. 5,080.

Trinidad. Most southerly island of the W. Indian Is. Geologically and biologically, it is a part of the S. American continent. Separated from Venezuela by the Gulf of Paria, it lies 7 m. N. of the mouth of the Orinoco between 10° 3' and 10° 50' N. lat. and 60° 55' and 61° 56' W. long. Its average length is 50 m., average breadth 37 m., area 1,864 sq. m. Pop. 500,000. The climate is tropical, rainfall averaging 1-3 ins. a month in the dry season, and 7-10 ins. a month in the rainy season (June-Dec.).

The white inhabitants are of English, French, Spanish, and



Trinidad. Map of the southernmost island of the British West Indies, discovered by Columbus in 1498. Right, the Government House

Portuguese origins; the coloured of African and Indian (from India). Those of E. Indian origin, numbering c. 190,000, are descended from indentured labourers imported during the 19th cent. to work in the sugar fields; they remain a distinct community with their own costume and language. Those of African origin are descended from slaves. Port of Spain (pop. 107,499) is the capital.

Agriculture is the main occupation; sugar, cocoa, coconut, and citrus fruits are the chief products. The sugar production in 1946 was 109,603 tons, providing employment for about 60,000. At St. Augustine is the Imperial College of Tropical Agriculture. Production of oil and asphalt are the principal industries, employing more than 14,000. Trinidad is one of the most important producers of petroleum in the Commonwealth, crude oil produced in 1946 amounting to 20,232,461 barrels; in the same year output of asphalt was 93,851 tons. Shipping is also an important industry. The chief imports are food, raw materials, manufactured goods, and cotton textiles. The deep water harbour of Port of Spain, opened in 1940, is the most important harbour in the W. Indies. At Port of Spain also is the principal air port.

During the Second Great War, defence bases were leased to the U.S. govt., 1941, for a period of 99 years. U.S. construction in and occupation of the areas concerned brought prosperity to the island, but depleted the ranks of agricultural workers so that food had to

be imported which would otherwise have been grown locally.

Trinidad is a crown colony and includes Tobago (q.v.) administratively. There is a governor, an executive council, and a legislative council. The governor is president, and the colonial secretary, the attorney general, and the financial secretary are members, of both councils:

dated the town, U.S. army flying boats helping in the rescue of more than 3,000 people clinging to trees and rooftops. Pop. 8,000.

Trinidad. Town of Cuba, in the prov. of Santa Clara. It is situated about 5 m. from its port, Casilda, and 46 m. S.E. of Cienfuegos. Sugar and coffee are produced locally. The present town is a few miles distant from the original settlement, founded 1514, where the house in which Cortes lived is still standing. Pop. 15,455.

Trinidad. City of Colorado, U.S.A., the co. seat of Las Animas co. It is 88 m. by rly. S. of Pueblo, and is served by the Atchison, Topoka, and Santa Fé and other rlys. It lies in a coal mining region, from which annually 1,500,000 tons are shipped; cattle ranges and sheep

flocks in the charge of shepherds of Basque origin are adjacent. Trinidad was incorporated in 1876, and became a city in 1879. Pop. 13,223.

Trinidad OR PORONGOS. Town of Uruguay. Capital of the dept. of Flores, it lies c. 105 m. N.N.W. of Montevideo. A town of wide



the remaining members of the executive council are appointed; six other members of the legislative council are appointed, nine are elected. Men over 21 and women over 30 have the vote.

Trinidad was discovered by Columbus in 1498. Sir Walter Raleigh in 1595 destroyed St. Joseph, its chief town at that time, and the island later was often raided by freebooters of the sea. At the time of the French Revolution many French families settled in Trinidad, which still has a strong French element. The British took the island in 1797 when they were at war with Spain; it was ceded to them by the treaty of Amiens, 1802. *Consult* Trinidad and Tobago Year Book (annually); Constitution of Trinidad, C. Reis, 1929; History of Trinidad, M. T. Benjamin, 1939.

Trinidad. Small island of the S. Atlantic. Rocky and uninhabited, it lies 745 m. E. of Rio de Janeiro. It belongs to Brazil.

Trinidad Town of Bolivia. Capital of the dept. of Beni, it lies c. 220 m. N.E. of La Paz, and close to the river Mamore. Here was formerly a celebrated Jesuit mission station. Floods in 1947 inun-

streets, it has a municipal building of note, schools, a R.C. and a Protestant church, and a fine cemetery. Pop. 81,000.

Trinil Man. Parts of a skull and of a thigh bone found at Trinil, Java, by Dubois in 1891-92. They have been established as the remains of a sub-human creature midway between the orang-utan and man in development. The probable period is Pleistocene, approx. 10 m. yrs. ago.

Trinitarians OR REDEMPTIONISTS. Religious order for men, founded in Paris, 1198, by S. John of Matha and S. Felix of Valois, with the object of redeeming Christians who were in slavery under the Moors. Members wore a white habit, with a red and blue cross on the breast. They divided their income equally for their own support, the relief of the poor, and the redemption of captives. In England in 1244 they established 11 small houses.

The Trinitarian nuns were originally an association of women who raised funds for the Trinitarian Order, and later became a religious congregation. Their mother house at Valence was founded in 1685. They have English establishments.

Trinitrin OR GLYCERYL TRINITRATE OR NITROGLYCERINE. Explosive substance. The glyceryl ester of nitric acid, it is given medicinally in the form of tablets to relieve angina pectoris. *See* Nitroglycerine.

Trinitrocresol. Highest nitration product of cresol. Formula, $C_6H_3CH_3.OH.(NO_2)_3$. It is manufactured like trinitrophenol, which it greatly resembles in properties, but it is less sensitive, slightly less powerful, and does not form such sensitive salts. Trinitro-metacresol is a yellow solid which crystallises as long needles, is slightly soluble in water, and melts at $100^\circ C$. Mixed with trinitrophenol it formed the standard French high explosive for shell filling and similar purposes before the First Great War, under the name of cresylite.

Trinitrophenol. Compound formed by the complete nitration of phenol; formula $C_6H_5(NO_2)_3OH$. Three isomerides are known, but the symmetrical one is the only variety of any commercial importance which can be prepared in quantity by direct methods. This isomeride is also known as picric acid, is an important military high explosive, and was formerly used as a dye—the oldest artificial dye known.

Picric acid was first prepared by Woulfe in 1771 by the action of nitric acid on silk. It found extensive use as a yellow dye, but its explosive properties were unknown until Sprengel discovered them in 1871. In 1885 Eugène Turpin took out patents for the use of picric acid as an explosive, and it was rapidly adopted for military use by most countries. In the dyeing industry it has now been largely displaced.

Picric acid is a high explosive of considerable brisance and is moderately insensitive. For military use it has been mixed with a variety of substances, especially dinitrophenol, to make it less sensitive and lower its melting point. The ease with which it combines with metals to form sensitive picrates is a marked disadvantage. *See* Lyddite.

Trinitrotoluene OR T.N.T. One of the most important high explosives, formed by the substitution of three nitro (NO_2) groups in the benzene nucleus of the toluene molecule. The chemical formula is $CH_3.C_6H_2(NO_2)_3$. Trinitrotoluene was first prepared by Wilbrand in 1863, and in a very pure state by Hepp in 1880, whilst much information regarding its manufacture and explosive properties was published by Häussermann in 1891,

when the German authorities experimented with it. The Germans adopted it as the standard military explosive in 1902.

In England it was manufactured only in small quantities for industrial use until the First Great War, when large plants were installed to meet the military requirements, and it became the most important high explosive in military use. The girls who filled shells during the First Great War were, owing to their T.N.T.-yellowed skins, called "canaries."

Trinitrotoluene is somewhat less powerful and brisant than trinitrophenol, but is much more advantageous, as it is less sensitive, is insoluble in water, is not acid, and does not form dangerous compounds like the picrates, has a lower melting point, simplifying casting, and is less dangerous to manufacture and use. It enters into the composition of many industrial explosives and is the most widely used military explosive. Because of its relatively low m.p. ($81^\circ C$) it can be easily liquefied by steam; shells, bombs, etc., can thus be filled directly by pouring. Its lower sensitivity, as compared with picric acid, has made possible the use of high-explosive shell of the largest calibres carrying a weight of explosive considered impossible before the introduction of trinitrotoluene. It is used for filling mines and torpedo warheads, bombs, hand grenades, etc. Owing to its marked deficiency in oxygen, T.N.T. is widely used in admixture with other substances rich in oxygen, particularly ammonium nitrate. Amatol (*q.v.*) is one of these mixtures. Ammunition was filled with later explosives, *e.g.* R.D.X., as a slurry in molten T.N.T. The wide use of this explosive is indicated by its many names. In the British service T.N.T. and Trotyl, in France Tolite, in Italy Tritolo, and in Spain Trilit. *See* Ammunition; Detonation; Detonator; Fuse; Exploder; Explosives; Gaine; Nitrator; Safety Explosive; Shell; Universal Shell.

Trinitroxylene. Tri-nitration product formed by the substitution of three nitro (NO_2) groups in the benzene nucleus of the xylene (dimethylbenzene) molecule. Formula, $C_6H_4(NO_2)_3(CH_3)_2$. Trinitroxylene is a somewhat less sensitive explosive than trinitrotoluene and about equal to it in power and brisance. *See* Amatol; Ammunition; Explosive; Melinite; Safety Explosive; Shell; Xylene.

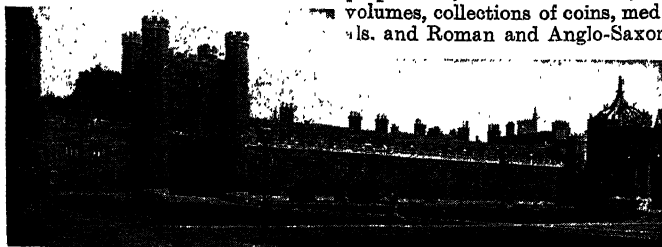
Trinity, THE HOLY. Theological term for the mystery of one God in three persons—the Father, the Son, and the Holy Ghost, co-equal in all things. The doctrine is derived from the O.T., is implied in the N.T., and is affirmed by the Athanasian, Apostles', and Nicene Creeds and Article I of the Church of England; but the word Trinity originated with Theophilus of Antioch, who wrote about A.D. 180. *See* Arianism; Hypostasis; Unitarianism.

Bibliography. Essays on the T. and the Incarnation, ed. A. E. J. Rawlinson, 1928; The Holy Trinity, J. P. Arendzen, 1937; The Interpreter Spirit, A. J. Macdonald, 1944; Doctrine of the Trinity, L. Hodgson, new ed. 1946.

Trinity College. The largest college of Cambridge university. It was founded by Henry VIII in 1546 by the amalgamation of nine earlier foundations, including Michaelhouse, founded by Hervey de Stanton in 1324, and King's Hall, founded by Edward III in 1337. The Great, or King's, Gate dates from 1518–35. Much of the buildings was remodelled by Thomas Neville, master 1593–1615. The interior of the Tudor chapel was restored 1870–75. The hall, 1604–08, has much in common with that of Middle Temple, London. The library, designed by Christopher Wren, 1676–95, is of remarkably fine proportions, and contains 150,000 volumes, collections of coins, medals, and Roman and Anglo-Saxon



Trinity College, Cambridge, arms



Trinity College, Cambridge. Great court and fountain; left of the main gateway are the rooms formerly occupied by Newton, Macaulay, and Thackeray

antiquities, carvings by Gibbons, MSS. of Milton, Thackeray, and Tennyson, the death mask of Newton, and Thorvaldsen's statue of Byron. There are five courts: Great Court, the fountain in the centre of which, erected in 1602, was rebuilt in 1716; Neville's or Cloister Court, c. 1612; New or King's Court, 1823-25; and two small ones, 1859-68, memorials of the munificence of Whewell.

Under statutes of 1926 Trinity is governed by a master, appointed by the crown; has about 75 fellows; and includes scholars, librarian, and the regius professors of divinity, Greek, and Hebrew. About 700 men are normally in residence *in statu pupillari*. Educated here were E. D. Adrian, Bacon, 1st Earl Baldwin, Lord Balfour, Isaac Barrow, Sir W. H. and Sir L. Bragg, Byron, Clerk-Maxwell, Coke, Cowley, Sir H. H. Dale, Dryden, Sir A. S. Eddington, Capt. Eyton, Dean Farrar, Fitzgerald, Sir J. G. Frazer, Galton, George Herbert, H. Jackson, Sir J. H. Jeans, Sir R. C. Jebb, Kinglake, Macaulay, Desmond MacCarthy, F. D. Maurice, A. A. Milne, Newton, Porson, Lord Rayleigh, Lord Rutherford, Stanford, Tennyson, Thackeray, Sir J. J. and Sir G. P. Thomson, Archbishop Trench, Sir G. O. and G. M. Trevelyan, R. Vaughan Williams, Whewell, A. N. Whitehead. Another former student was Pandit Jawaharlal Nehru, first premier of India. Among masters were Whitgift, Barrow, Bentley, Whewell, Sir J. J. Thom-

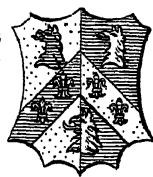
freshmen and later sophisters—while the rest reside in authorised lodgings. At its head is a provost, and its legal complement of members is, in addition to him, seven senior fellows, 25 junior fellows, and 70 scholars. Since 1903 women have been admitted to its degrees. Three members were sent to the Dáil until 1937.

The Palladian façade (1759) faces College Green in the centre of Dublin. Queen Elizabeth's original



Trinity College, Dublin, arms

known as Durham College. It is under a president. The buildings lie between Broad Street and Parks Road and are surrounded by beautiful grounds. They include the remains of Durham College, and a quadrangle by Wren, later modified. The classical chapel, 1691, contains the founder's tomb and carving by Gibbons. Distinguished members of Trinity were Chatham, Newman, Lord Goddard, Cyril Alington, A. E. W. Mason, Ronald Knox, Sir Kenneth Clark.



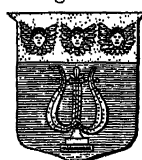
Trinity College, Oxford, arms



Trinity College, Oxford. New quadrangle, containing the chapel, left, and the president's lodging adjacent. To the right are the buildings erected in 1887

charter placed the college on the site of the monastery of All Hallows, and its quiet quadrangles are in the heart of a bustling city. In Parliament Square are the chapel, examination hall, a beautiful campanile (1853), and the library. This last, begun in 1712, receives a copy of every book published in the U.K., and contains the Book of Kells and hundreds of priceless

Trinity College of Music. Association in London for the encouragement of musical study.



Trinity College of Music, arms

Founded in 1872 and incorporated in 1875 as Trinity College, London, it obtained its present title in 1904. All branches of music are taught, and a full professional curriculum is in force, as well as facilities for amateur study. The college was the pioneer in local examinations in musical knowledge, 1877, and in practical music, 1879. Under the scheme for higher examinations started in 1874 diplomas of licentiate and associateship are awarded to external students as well as to pupils of the college. The building is in Mandeville Place, Manchester Sq., W.1.

Trinity Hall. College of Cambridge university. It was founded in 1350 by William Bateman, bishop of Norwich, for a master, 13 fellows, and certain scholars, specially for the study of canon and civil law. The chapel was consecrated in 1513 and restored 1729-30 and 1864. The library, c. 1590,



Trinity Hall, Cambridge, arms



Trinity College, Dublin. First Quadrangle, called Parliament Square, with the campanile. Left, portico of the chapel; right, the examination hall

son, and from 1940 G. M. Trevelyan. First Trinity boat club represents the original club, while Third Trinity is confined to Eton and Winchester men.

Trinity College. Irish university in Dublin. Founded in 1591, it was for long confined to members of the Anglican Church. In 1873 religious tests were abolished and it was thrown open to all, but it still remains in many respects a Protestant society. It consists of one college only and is residential, accommodating about 270 undergraduates—who are called

Irish MSS. Elsewhere are laboratories, the museum, and buildings of the medical school: There is an observatory in the gardens, and the college park serves for recreation and sport. The college has a botanic garden at Balls Bridge and an astronomical observatory at Dunsink. See Gowns colour plate; University. Consult History, C. Maxwell, 1946; K. C. Bailey, 1947.

Trinity College. College of Oxford university. It was founded in 1555 by Sir Thomas Pope, who obtained for the first buildings a house of Benedictine monks



Trinity Hall, Cambridge. First court and main gateway, looking towards the east side, rebuilt after fire in 1852

possesses a remarkable collection of law books, with the original bookcases equipped with locks and staples, but the old chains have been renewed. New buildings were added in 1909-10, 1926 and 1934. Fifteen milestones on the London road, set up by the college in the 18th century, bear its crest. Notable members have included Stephen Gardiner, Gabriel Harvey, Tusser, Herrick, the 4th earl of Chesterfield, Bulwer Lytton, F. D. Maurice, Henry Maine, Leslie Stephen, Lord Maugham, J. B. Priestley, and Arthur Henderson, jr.

Trinity House. British corporate authority. It governs pilotage in England and Wales and as the general lighthouse authority for the same area together with the Channel Islands and Gibraltar, controls lighthouses, lightships, beacons, and buoys around those coasts, and has certain statutory jurisdiction regarding lighthouses in Scotland and N. Ireland and over local harbour lights. It is also responsible for marking and removing wrecks dangerous to navigation. Trinity House was already a guild of mariners when granted its first royal charter in 1514. It has considerable property, maintains almshouses, and gives pensions to distressed mariners and their widows. Elder brethren of Trinity House are chosen from among members of the royal family, statesmen, retired naval officers of high rank, and prominent officers of the merchant navy. Winston Churchill made the elder brother's uniform famous by the frequency with which he wore his. The h.q. is Trinity House, Tower Hill, London, E.C.3. There are Trinity Houses at Hull and Newcastle. See *Pilot*. Consult Trinity House, H. P. Mead, 1947.

Trinity Sunday. In the Church calendar, the Sunday after Whitsun. The octave of Pentecost has long been specially dedicated to the worship of the Trinity. The festival was first authorised by

Celtic bishops to the supposed early connexion of their church with S. John. Observance first became general under Becket at Canterbury, as the anniversary of his appointment to the see. In the Church of England, Sundays between Trinity and Advent are designated 1st, 2nd, etc., after Trinity. At Oxford and Cambridge Trinity Sunday is a "scarlet" day, on which doctors of divinity wear their red robes.

Trinobantes. Celtic tribe settled in Essex and thereabouts at the time of the Roman occupation of Britain. They submitted to the rule of the Romans until A.D. 61, when they joined the revolt of the Iceni under Boadicea. After the suppression of this the Trinobantes disappear from history.

- Trinoda Necessitas (Lat., threefold necessity). Term used for the three obligations laid upon land-holders in Anglo-Saxon times

Gregory IV in 828, and has been held on the present day since 1334. There are grounds for believing that the name Trinity Sunday originated in England, where S. Augustine found its observance among other local customs attributed by

of an instrumental piece, e.g. of the scherzos or minuets which form third movements of many classical symphonies, may also be called a trio, having been assigned originally to three instruments only.

Triode. Simplest form of radio valve. It contains three electrodes: a cathode which may be either a directly heated filament or indirectly heated by electrical means; an anode; and a grid to control the passage of current from one to the other. Triodes are generally used for rectification or detection of radio currents, but serve also for amplification of radio frequency or low frequency currents. A triode on a regenerative circuit can be made to generate audio-frequency currents. See *Thermionic Valve*.

Triplet. Verse form derived from the early French dance-songs. It consists of eight lines, usually octosyllabic, though trimeters are common in English; the 1st, 4th, and 7th lines are identical, rhyming with the 3rd and 5th, while the 8th line is the same as the 2nd and rhymes with the 6th, having usually a feminine ending. The Little Child, by Louis Tiercelin, is a perfect French example, and in English, Graham Tomson's *The Roses are Dead* may be given as an example of the triplet in trimeter:

The roses are dead
And swallows are flying:
White, golden, and red,
The roses are dead;
Yet tenderly tread
Where their petals are lying.
The roses are dead
And swallows are flying.

Bridges and Dobson revived the form in the 19th century, and Coulson Kernahan applied it lightly to sport.

Tripe. Name given to a food dish prepared from either the paunch or the reticulated second stomach of a ruminant animal. Having been cleansed and boiled, it is cut in slices and reboiled, usually with onions, and served with a



Trinity House. Headquarters of the maritime corporation at Tower Hill, London, built 1793-95

in England. They were the necessity to serve in the fyrd (*q.v.*), to repair bridges, and to man fortified places. The describing phrase was not used until the 17th century, but documents of Anglo-Saxon times refer to the three obligations.

Trio. Musical term for a composition, vocal or instrumental, for three soloists. The middle section

milk sauce or thick brown gravy. **Tripe de Roche** or **ROCK TRIPE** (*Umbilicaria*). Genus of lichens growing on rocks, chiefly in the mountains and the Arctic regions. The fact that they contain some nutritive value, like Iceland moss (*Cetraria*), has caused them to be eaten when other food failed, e.g. by Franklin and Richardson on

their Arctic expeditions. The lichens contain, however, a bitter purgative principle dangerous to some persons.

Triphenylmethane ($C_{19}H_{15}$). Solid hydrocarbon obtained by the interaction of chloroform and benzene in the presence of aluminium chloride. The liquid thus obtained is distilled and yields benzene, diphenylmethane, and triphenylmethane, the last product being separated by crystallisation. Triphenylmethane is the parent substance of a group of dyes.

Triple Alliance. Name given to certain alliances involving three countries. The most famous was made between Germany, Austria, and Italy in 1882. Renewed several times, it was broken when, in 1914, Italy refused to join in the war against France, Russia, and Great Britain. *See* Europe; Germany; Italy.

Triple Entente. Name given to various agreements or understandings made in the 20th century, between Great Britain, France, and Russia, which were insufficiently formal to be called alliances. *See* Entente Cordiale.

Triplet. In music, an abnormal division of a note into three, instead of two, equal notes of lesser value.



Triplets. Three young at a birth. Human triplets, occurring about once in 10,000 births, may arise from the fertilisation of one, two, or three ova. Any woman of British parentage giving birth to triplets receives the King's bounty (£3).

Tripoli (Gr., three cities). City and port of Libya, North Africa, the capital of Tripolitania. On a point of land jutting into the Mediterranean, it is a typical Moorish city, containing mosques, a Spanish fortress, and many gardens. The Italians put up numerous govt. buildings. The most celebrated monument is the marble arch of Marcus Aurelius. The city stands on the site of the ancient Oea, one of the three cities, of which Leptis and Sabrata were the others, forming the federal union called Libya Tripolitania. In the 7th century Tripoli fell under Arab domination, and in the 16th century was captured by the Turks. From it famous caravan routes diverge to Lake Chad, Timbuktu, and Darfur. The Italians constructed a fine harbour here and rlys. to Zuara (68 m.), Garra (61 m.) and Tagiura (13 m.). During

the Second Great War, Tripoli escaped with little damage. It was entered by the British 8th army Jan. 23, 1943. *See* North Africa Campaigns. Pop. (1938) 108,240. *See* Africa; Tripolitania; Tripoli War.

Tripoli or **TARABULUS.** Town of Lebanon. About 40 m. N.N.E. of Beirut, it lies 2 m. from the Mediterranean, its port being El Mina. It is connected by rly. with Homs (Syria) to the E., Haifa (Palestine) to the S. It has a considerable trade in silks, wool, grain, oranges, and sponges. It figured in the Crusades. During the First Great War it was occupied, without resistance, by the British, Oct. 13, 1918, in the course of the conquest of Syria. Pop. 71,501.

Tripoli Powder. An earthy mineral, white, yellow, or pink in colour, consisting of friable silica derived from the natural leaching of rock. It is used in various grades of fineness as an abrasive and polishing powder.

Tripolis or **TRIPOLITSA.** Town of Greece. Situated nearly in Central Peloponnese, it is the capital of the dept. of Arcadia. It stands on a plain 2,000 ft. alt., 20 m. W.S.W. of Argos, with which it is connected by rly. It was the capital of the Morea when the Turks held Greece. During the War of Independence it was stormed and burned by the Greeks in 1821, but was recaptured from them by Ibrahim Pasha in 1825. Pop. 14,397.

Tripolitania. Name given by the Italians to the western portion of Libya, sometimes called Tripoli. Until 1912 it was a Turkish vilayet. It has four distinct geographical regions. The first along the seaboard is fertile, and contains palms and fruit trees. The second, formed by the highlands of Jebel Nefusa and Tarkuna, includes large areas suitable for cereals. Much of this part of Tripolitania is covered with esparto grass. The third region has many oases, while the fourth, extending into Fezzan (*q.v.*), is mainly desert, except in the W. The climate is healthy, but hot, with the world's record shade temp. of 136° F. (Sept. 13, 1922).

Great quantities of dates, figs, olives, cereals, grapes, and almonds are grown and exported, and esparto grass is an important article of commerce. There is a considerable trade with the interior over the caravan routes, most of which have been used since the earliest times. The principal

caravan trade is between Benghazi, in Cyrenaica, and Wadai and Tripoli and the Central Sudan, via the oases of Fezzan. The chief centres of population are Tripoli (*q.v.*), Aziez, Homs, Misurata, Sirte, Nofilia, and Ghadames, the last an important oasis in the W. The pop., (est. 806,000 in 1947) is principally Arab and Berber in the N., negroid in the S. Europeans, the great majority Italian, constitute less than 10 p.c. of the whole. Area, 96,500 sq. m.

Tripolitania contains many remains of antiquity, in particular at Leptis and Sabrata (*qq.v.*). The original settlements of the Phoenicians passed to the rulers of Barca (Cyrenaica) and afterwards to the Carthaginians. Later the region was occupied by the Romans, the Arabs, the knights of S. John, and in 1551 by the Turks, who ruled it until it was taken by Italy (*see* Tripoli War). The course of the Second Great War in Tripolitania is described under North Africa Campaigns. From the conquest of the country by the British 8th army in 1943, Tripolitania was administered by the U.K. In 1949, the U.N. decided that the whole of Libya—Cyrenaica, Tripolitania, the Fezzan—should be united and independent by 1952. Pending Libyan independence, British administration of Tripolitania continued.

Tripoli War. France having secured Tunisia (*q.v.*) on which Italy had set her heart, that country determined to secure Libya, where there was, by the beginning of the 19th cent., some considerable Italian settlement. During the summer of 1911 she carried on diplomatic exchanges with the Sublime Porte, and then on Sept. 28 sent a 24-hr. ultimatum intimating that her interest in Tripoli made it necessary for her to undertake, by means of a military occupation, a civilizing mission in the area. Next day she declared war on Turkey, attacking Tripoli from the sea on Oct. 3. The Turks withdrew from the city in face of a landing party, and the Italians occupied it. They also occupied Derna, Homs, and Benghazi (Cyrenaica) without serious opposition. Desultory fighting continued until the spring, when the Italians began to attack once more, defeating the Turks and the Arabs, who supported them, at a number of points. In Oct., 1912, Turkey signed with Italy the treaty of Ouchy, renouncing her sovereignty over Libya. Italy, was, however, in

possession only of the coast, and she had to contend with the opposition of the Arab inhabitants of the interior (who as Muslims owed religious as well as political fealty to the sultan) until the break-up of the Turkish empire during the First Great War, after which she secured control of the whole of Libya.

Tripous (Gr. *tripous*, three-footed, tripod). In Cambridge university, name given to the honours degree examination in certain subjects. As far back as the 16th century tripous was the name given to the three-legged stool on which the champion of the university sat during the disputations held when undergraduates were admitted to the degree of B.A. The oldest of these examinations is the mathematical tripous, 1747. See Cambridge University.

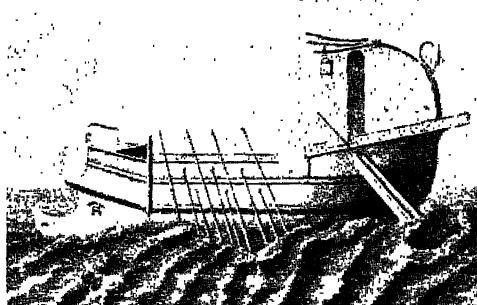
Triptolemus. In Greek mythology, son of Celeus, king of Eleusis. In gratitude for the hospitality shown to her by Celeus when she was wandering over the earth in search of her daughter Persephoné (*q.v.*), the goddess Demeter gave Triptolemus a chariot with winged dragons with which to visit the whole world and give mankind seeds of corn. On his return Triptolemus instituted the festival of the Thesmophoria (*q.v.*), one of the two great festivals to Demeter. *Pron.* Trip-tolly-mus.

Triptych (Gr. *triptychos*, three-fold). In ecclesiastical painting, a set of three upright panels, joined together by hinges, each one being painted with a distinct subject. The wings were usually painted on both sides, so that when they were folded a fresh picture was presented. In later triptychs canvas pictures were often inserted in the compartments. The Van Eycks and nearly all the great religious painters of the early Renaissance used the triptych, which disappeared in the 16th century. *Pron.* triptik. See Byzantine Art.

Tripura. Indian state which until 1947 was in the Eastern states agency but attached for some administrative purposes to Bengal. It lies E. of the Tippera and S. of the Sylhet districts of Pakistan, covering 4,116 sq. m. of mountainous country. The state has its own chronology, starting an era in A.D. 590. Agartala is the chief town. Pop. (1950 est.) 580,000.

Trireme (Lat. *triremis*, from *tres*, three; *remus*, oar). Warship of the ancient Greeks and of the Romans under the republic, provided with three tiers of oars. Such vessels are said to have been first

built at Corinth. The fully-developed trireme was about 140 ft. long, with two masts and a beak or ram. The complement was 200, of whom



Trireme. Reconstruction of an oar-driven ship used on the Mediterranean in early Classic times

170 were rowers, one to each oar. How the rowers were disposed is much disputed. Ships were also built with four, five, or more banks of oars—quadriremes, quinqueremes, etc. See Galley; Ship. Consult Ancient Ships, C. Torr, 1894.

Trisagion (Gr. *tris*, thrice; *hagios*, holy). In theology, the name of a liturgical formula, which was based upon Isaiah 6, v. 3, and came into use towards the end of the 4th century. The words are: "Holy God, Holy Mighty, Holy Immortal, have mercy upon us." They are sung in the liturgy of Constantinople; and in the R.C. liturgy are said by the celebrant at the Adoration of the Cross on Good Friday.

Trismegistus. Word meaning thrice greatest. The Greeks applied it to Thoth, the Egyptian god, who was to them Hermes Trismegistus. The name also appears in Sterne's *Tristram Shandy*. See Thoth.

Tristan and Isolde. Opera in three acts by Wagner. The poem, based on the Arthurian legend, was begun by Wagner at Zürich in 1857 (at the reputed suggestion of the emperor of Brazil); the second act was written at Venice, and the third at Lucerne, 1859. Not produced until 1865, at Munich, when Ludwig Schnorr sang the part of Tristan to his wife's Isolde, it was first given in London at Drury Lane in 1882, and received its first performance in English by the Carl Rosa co. at Liverpool, 1898. A masterpiece of eroticism and beauty, this opera ranks with *Siegfried* in its ingenious use of *leit-motiv*. The love dust is a famous example of the emotional intensity and poetic feeling with which the entire work is imbued.

Tristan da Cunha. Lonely island group in the S. Atlantic. It

comprises four small islands, 44 sq. m. in extent, Tristan da Cunha proper, Gough's, Inaccessible, and Nightingale, as well as a number of

rocks. It is situated 1,500 m. S.S.W. of St. Helena, and almost midway between Cape Town and Buenos Aires. Tristan da Cunha proper, the largest and only inhabited island, is an extinct volcano, 8,000 ft. high, the habitable area being a plateau on the N.W. side, 100 ft. above sea level,

and 12 sq. m. in extent. Only about 30 acres is cultivated, mostly for potatoes; there are fruit trees, and cattle, sheep, and geese are kept. In 1880 the pop. was 109, in 1944, 222.

The group was discovered in 1506 by Tristan da Cunha, Portuguese navigator, and it came under British rule in 1816. Most of the inhabitants are descended from shipwrecked sailors, and soldiers who elected to remain when the garrison was withdrawn in 1817, and coloured women from Cape Colony. In 1932 the colonial office sent out the Rev. A. G. Partridge to organize the island. He set up a chief, with three officers to assist. The chief's mother was appointed head woman. In 1942 the island was commissioned as H.M.S. Atlantic Isle. It is a valuable meteorological and radio station. Consult I Went to Tristan, A. B. Crawford, 1941.

Tristram OR TRISTRAM, SIR. Hero of a medieval legend of Welsh or Cornish origin, which was drawn into the Arthurian cycle. Nephew of Mark, king of Cornwall, Tristram is sent to Ireland to bring Isolt or Isolde as his uncle's bride; but when he and she have unwittingly drunk a magic potion, they love each other. Discovered by Mark, he flees to Brittany, where he marries another Isolt, of the White Hand. Having summoned Isolt of Cornwall to heal him of a wound, he is falsely told by his wife that her rival refuses her aid, and the lovers die of grief. There are medieval versions of the legend in many languages, which appear to be based on an Anglo-Norman poem of the 12th century. The finest is the German poem of Gottfried von Strassburg, followed by Wagner. Malory retells the story

in *Le Morte d'Arthur*. It is the theme of Swinburne's *Tristram of Lyonesse*, Arnold's *Tristram and Iseult*, and Tennyson's *The Last Tournament*, while it has also been used by Gaston Paris and other French writers. Wagner's opera is known in English as *Tristan and Isolde* (*q.v.*). See *Iseult*; Thomas the Rhymmer.

Tristram Shandy. Humorous novel by Laurence Sterne, published in nine volumes, 1759-67. The full title is *The Life and Opinions of Tristram Shandy, Gent.* Sterne's only work of fiction, it is a loosely constructed narrative, full of digressions, and follows the tradition of Rabelais and Cervantes, although it is a great original creation. The delineation of character in Walter Shandy and his brother Uncle Toby, in Corporal Trim and the Widow Wadman, is masterly. Full of curious learning, whimsical indecorous wit, sentimentality and self-revelation, and poignant humour, it is a landmark in the history of English fiction.

Tritium. An artificial radioactive isotope of hydrogen (^3H), having one proton and two neutrons in the nucleus, and hence at wt. 3. It emits β -rays; has half-life 12 yr.; and is made in an atomic pile by bombarding deuterium with neutrons ($^3\text{H} + \frac{1}{2}\text{n} = ^3\text{H}$). It has been suggested that the synthesis of tritium with ordinary hydrogen to produce helium might form the basis for the so-called hydrogen or super bomb. See *Atomic Bomb* in N.V.

Triton. In Greek mythology, a minor sea deity, son of Poseidon. According to later legends there were several Tritons attendant upon Poseidon. These were represented as part men, part fish, and blew shells as trumpets.

Tritonal. Explosive used with great effect as a bomb filling during the later stages of the Second Great War. It is a mixture of T.N.T. and aluminium powder. In the filling process the molten material was used.

Tritonia or **MONTBRETIA.** Genus of bulbous herbs of the family Iridaceae, natives of S. Africa. They have sword-shaped leaves in two rows, clasping at the base, and before flowering they look like delicate forms of gladiolus. The tubular flowers are borne on two-rowed spikes. The most generally cultivated species is the hardy *T. pottii* with orange flowers.

Triumph (Lat. *triumphus*). In ancient Rome, the ceremonial entry into the city of a successful general.

The honour could be granted only by the senate. The general was received at the gate by the senate and magistrates who headed the procession. They were followed by men bearing specimens of the products of the conquered territory, by the chief prisoners taken, walking in chains, and finally by the general in a chariot drawn by four white horses, with his troops marching behind. The procession passed along the Sacred Way to the Capitol, where a sacrifice was offered to Jupiter.

Triumphal Arch. Ornamental archway such as those erected by the ancient Romans to commemorate victories. Of the 38 built in Rome, those of Titus, Septimius Severus, and Constantine still stand, the last two being triple. Roman triumphal arches were often surmounted by a *quadriga* or four-horse chariot. Similar arches were built in other Roman cities in honour of benefactors, or simply to decorate important streets. There are fine examples in S. France, the one at Orange being regarded as the finest in the country. It was restored after 1825. Among modern examples are the arches built or begun by Napoleon in Paris and Milan, the Brandenburg Gate in Berlin, built 1789-93, and in London, the Marble Arch (*q.v.*), the arch on Constitution Hill,



Triumphal Arch of Titus, in the Via Sacra, Rome, celebrating his capture of Jerusalem, A.D. 70

and the Admiralty arch in the Mall. See *Arc de Triomphe*; Arch; Berlin; Lille; Paris; Rimini; Saintes; S. Rémy.

Triumvir. In ancient Rome, member of a commission of three charged with some specific duty, such as repairing temples, coining money, or establishing Roman rule in overseas territories. The most noted Triumvirate was that of Octavian, Antony, and Lepidus, who in 43 B.C. were charged with the duty of "restoring the republic." This was known as the Second Triumvirate, to distinguish it from the private combination of Caesar, Pompey, and Crassus in 60, which, though without an official title, was popularly known as the First Triumvirate. See *Rome*.

Trivandrum. Capital of the union of Travancore-Cochin, India. It contains fine buildings, e.g. the university, the maharaja's palace, and the museum. In the fort are several palaces and a famous shrine, dedicated to Vishnu called the Padmanabha, and a great resort for pilgrims, around which the city has been built. Quilon (Marco Polo's Kailum where the Chinese once had a colony manufacturing porcelain) is 44 m. to the S.E. The port of Trivandrum cannot take large vessels; ships have to lie off shore at anchor. Pop. 128,365.

Trnovo. Alternative spelling of the name of the Bulgarian town entered under Tirnovo.



Tritonia. Flower spike and sword-shaped leaves of the South African herb

Trochee (Gr. *trechein*, to run). In prosody, a metrical foot containing a long, accented syllable followed by a short, unaccented one, as used in *e.g.*

Télle me | nó | in | mó | úrnful | nú | mé | bers

Troezén. Ancient Greek city. Its ruins lie near the modern village of Damala in Argolis at the N.E. corner of the Peloponnesus. Troezén was the birthplace of Theseus. A Dorian city, it was active in the defence against Xerxes, and was a place of refuge for the Athenian women and children; during the Peloponnesian War it was an ally of Sparta. Hippolytus (*q.v.*) is supposed to have met his death here.

Trogir (Ger. Trau). Town in Dalmatia, Yugoslavia. It is 10 m. W. of Split, on an island in the Adriatic between the mainland and the island of Bua. A republic in the 10th century, it then fell under Venetian sway, and so remained until both it and Venice were added to Austria in 1797. The produce consists mainly of oil, wine, and fruit.

Troglodytes (Gr. *troglē*, cave; *dyein*, to creep into). Tribes of primitive cave-dwellers located by classical writers on the outskirts of the ancient Greco-Roman world. The most renowned inhabited a region (Troglodytica) along the southern Red Sea coast of Egypt. Though they had domesticated cattle, their scanty clothing, use of shell necklaces, and other customs indicated a culture derived from a remoter Stone Age. Those of the N. African coast similarly perpetuated a Palaeolithic past; their caves are still occupied by Libyan communities. *See* Cave Dwelling.

Trogon. Family of tropical birds. Remarkable for their brilliant plumage and often having very long tail feathers, they are native to Africa, S. Asia, and Central and S. America, and include nine genera and many species. The S. American trogons are especially striking, their plumage being mainly metallic green and blood red; their tail feathers are several times the length of the body.

Troilus and Cressida. Play by Shakespeare. The scene is laid in Troy, and the story ostensibly concerns the love of Troilus, son of King Priam and brother of Hector, for Cressida, daughter of a Trojan priest who has gone over to the Greeks and taken her to their camp. Thus far the plot is based on a medieval legend treated in Boccaccio's poem, *Il Filistrato*, Chaucer's *Troilus and Criseyde*, Caxton's *Recuyell of the Historys*

of Troye, Lydgate's *Troy booke*, and a play by Dekker and Chettle. But Shakespeare's play is far more to be read as a cynical commentary on the ideas of romantic love and glorious warfare. He seems to be giving vent to an embittered philosophy in the characters of Therisites, a slave who rails at everybody; Ulysses, who has magnificent speeches on the motives of men; and Cressida's uncle Pandarus, who has given the word *pander* or *pander* to the language. Composed probably about 1603, and first printed in quarto, 1609, the play contains 3,423 lines, including 2,025 of blank verse, 1,186 prose, and 196 pentameter rhymes. Not often revived, it was played at Stratford memorial theatre in 1936; Westminster Theatre (modern dress), 1938; Regent's Park (open-air), 1946.

Troitska or **TROIKA** (Russ. *troie*, three). Form of sleigh on runners. It is drawn by three horses abreast, and is much used in Russia as a carriage when the roads are snow-bound. The word is also used for a team of three horses. *See* Sleigh.

Trojan War. Name given to the semi-legendary ten years' war between the Greeks and Trojans. Originally caused by the abduction of Helen by Paris, it ended in the defeat of the Trojans and the capture and destruction of Troy. The story probably had its origin in the struggle for supremacy between Greek colonists and the non-Greek early inhabitants of the district. As well as being the basis for immortal epics by Homer and Virgil, it was a favourite subject of the French romance writers, in particular Benoît de Sainte-Maure. *See* Aeneid; Helen; Iliad; Priam.

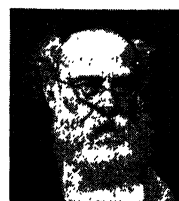
Troll or **TROLD.** In Scandinavian folklore, a creature sometimes described as a mere unearthly spectre. Sometimes, however, trolls are giants or giantesses possessed of magical and generally maleficent powers. The term is also used of vague beings approximating to the earth-dwelling dwarfs and gnomes. In Icelandic legends the trolls are cannibalistic.

Trolley-bus. Passenger road vehicle, electrically driven by a motor taking its power by trolley-wheel collector from an overhead cable, like an electric tram, the return being made not through rails on the ground but by a second and parallel trolley to a second and parallel overhead cable. The double cable and double trolley are therefore the distinguishing features of a trolley-bus system; but for the rest, the vehicle is fitted with pneu-

matic tyres and is as manoeuvrable as a petrol-driven vehicle. It was developed experimentally in German towns before the First Great War, and several routes were put into operation in the U.K., but after the First Great War trolley-buses rapidly replaced trams in many populated areas where the permanent tracks of the latter were found to contribute to traffic congestion. The change was made to trolley-buses rather than motor-buses because the existing generating stations used for tramways could be retained. One great disadvantage of the trolley-bus system is inherited from tramways, namely, that vehicles cannot be diverted from their routes, and a breakdown at the power station brings the whole system to a standstill. *See* Electric Traction, and *illus.* p. 3001; Tramway.

Trollhätten. Town of Sweden, in the co. or *län* of Göteborg and Bohus. It stands on the Göta river, 45 m. by rly. N. of Gothenburg. The Falls of Trollhätten supply motive power for rolling mills, cellulose factories, machine shops, and foundries. The Göta and Trollhätten canals avoid the six main falls and other smaller rapids. The town covers several islands as well as parts of both banks of the river. Pop. 22,108.

Trollope, ANTHONY (1815-82). British novelist. Born in London, April 24, 1815, he was the third



son of Thomas and Frances Trollope (*v.i.*). Educated at Winchester and Harrow, he entered the postal service in 1834, and in 1841 was transferred to Ireland. His duties there involved much travelling, and there he wrote his first novels. Back in England, he reached a high position in the postal service, his work being mainly that of an inspector, an occupation pleasantly varied with long official journeys to foreign countries and British colonies. He retired in 1867 and died Dec. 6, 1882.

Of Trollope's novels the best known are the so-called Barchester series. This began with *The Warden*, 1855, and was followed by *Barchester Towers*, *Framley Parsonage*, *Dr. Thorne*, and *The Last Chronicle of Barset*. They give a picture, often satirical, of what Trollope supposed life about an English cathedral city to be.

Trollope's gift for drawing characters true to themselves and to life is seen on almost every page, notably in Mrs. Proudie, Mr. Harding, and his son-in-law, Archdeacon Grantly. His other novels include *The Prime Minister*, *The Claverings*, *Orley Farm*, *Rachel Ray*, *The Small House at Allington*, and *The Three Clerks* containing some of his experiences in the civil service. Besides this enormous output of fiction Trollope wrote many books of travel, *Lives of Thackeray and Caesar*, and contributed largely to the reviews and magazines; for some time he edited *St. Paul's Magazine*. He also wrote an *Autobiography*, edited by his son, H. M. Trollope, 1883. This, though interesting, revealed so much of his methodical way of working that his popularity at once declined. The enormous volume of his work is accounted for by the fact that he wrote steadily a fixed number of words every day and was free from sentiment about inspiration and moods. *Consult Life*, H. Walpole, 1927; *Trollope: A Commentary*, M. Sadleir, rev. ed. 1945; *The Trollopes: A Chronicle of a Writing Family*, L. P. and R. P. Stebbins, 1945.

Trollope, FRANCES (1780-1863). British author. Born at Stapleton, Bristol, March 10, 1780, daughter of



F. Trollope
After L. Adams

William Milton, she married in 1809 Thomas Anthony Trollope (1774-1835), with whom she spent 1827-30 in the U.S.A. As a result of this visit she published in 1832 *Domestic*

Manners of the Americans, a book which gave a good deal of offence in the U.S.A., especially in its reference to slavery. Having returned to Europe, she wrote a long succession of novels, including *The Vicar of Wrexhill*, 1837, and *Widow Barnaby*, 1838, until her death at Florence, Oct. 6, 1863. These are all but forgotten, though they enabled her to maintain herself and her family in comfort after her unlucky husband died a ruined man. Anthony Trollope (v.s.) was her third son.

Trombone. Wind instrument, developed from the sackbut (q.v.). It consists of two lengths of cylindrical brass tube, bent so as to render it easy to handle, and having a mouthpiece at one end and a bell at the other. One length of the tube is

the slide, by moving which the player is able to vary the length of the instrument and thus obtain different harmonic series. These variations, seven in number, are called positions. The first is when the slide is not pulled out; each successive position lowers the pitch by a semitone. Owing to the necessary difference in the diameter of the two tubes, and to the unavoidable disproportion between the bore and the varying lengths, correct intonation is not mechanical, but depends upon the efficiency of the performer. Notes actually to be played are written. The trombone is made in three or more sizes: alto in E flat, tenor in B flat, and bass in G or F. The tenor is a 4th higher than the bass. The tone is rich and noble, making the trombone indispensable to a full orchestra.

Tromp, CORNELIUS (1629-91). Dutch sailor. Born at Amsterdam, Sept. 9, 1629, the son of

Martin Tromp (v.i.), he commanded a ship in the expedition to Morocco, 1650, and served against the English in the Mediterranean, 1652-53. He was defeated in the North Sea battle of 1665, and next year was deprived of his commission. This was restored to him in 1673, in which year he took part in the battle of Schooneveld. In 1675 he visited England and was received by Charles II, who made him a baron. Tromp was appointed lieutenant admiral-general of the United Provinces, 1676, and had been given command of an expedition against France when he died at Amsterdam, May 29, 1691, and was buried at Delft.

Tromp, MARTIN HARPERTZON (1597-1653). Dutch sailor. Born at Briel, April 23, 1597, he entered the navy as a boy, rising to admiral at 40. In 1639 he defeated a Spanish fleet off Gravelines, and he served in the campaigns of 1640-41. He was defeated by Blake, May 19, 1652, off Dover, but took revenge on Nov. 29 at the battle of Dungeness, after which, it

is said, he sailed up the Channel with a broom tied to his masthead to symbolise the sweeping of the seas. This sea-man, often miscalled Van Tromp, was one of the most gallant and successful that the Netherlands produced. In 1653 he encountered the English off

Portland, N. Foreland, and Scheveningen, in the last of which engagements he was defeated by Monk, losing thirty men-of-war, and was killed by a bullet through the heart, July 31. He was buried at Delft. His *Journal* was trans. and ed. C. R. Boxer, 1930.

Tromsø or **THOMS.** Amt or co. of Norway. It lies in the N. of the peninsula, between Finmark and Nordland, and has a deeply indented fjord coast flanked by Senjen, Ringvassø, and numerous smaller islands. Fishing is the chief occupation. There are settlements of Lapps. Area 10,005½ sq. m. Pop. 113,229.

Tromsø. Seaport of N. Norway. Within the Arctic Circle, on the island of Tromsø, it is the chief port for Spitsbergen, and the seat of a bishopric. Despite its lat., 69° 50' N., it has a relatively mild climate. The chief industry is fishing. Boats and ships are built, ropes and nets made. The town dates from 1250. Pop. 10,785.

Tromsø first figured in the Second Great War as the port to which the U.S. steamer *City of Flint* (q.v.) was taken by a prize crew from the German pocket battleship *Deutschland* on Oct. 21, 1939. In the early stages of the German invasion of Norway, it was the base of the British aircraft carrier *Furious*. After occupation by the Germans, the port was developed as a seaplane base, whence air attacks were delivered on Allied convoys to Murmansk. On Nov. 12, 1944, British bombers sank the battleship *Tirpitz* (q.v.) at anchor in Tromsø Fjord.

Tron or **TRONE.** Obsolete Scottish standard of weight. The name is derived from the post supporting



Martin Tromp,
Dutch sailor
After Lievens



Cornelius Tromp,
Dutch sailor



Trombone. Tenor instrument
in B flat

Courtesy of Boosey & Hawkes

the balance of the town scales set up in market places for weighing wool, cheese, butter, etc. The tron lb., nominally of 20 oz., ranged from 21 to 28 oz., according to the usage of the several market towns. The tron stone contained 16 lb. The word survives in Trongate, Tron Steeple, and Tron Church, Glasgow.

Trona. Native form of hydrated basic carbonate of soda known to the ancients as nitrum.



Trona is found in saline residues in Egypt, Mexico, California, and S. America.

Trøndelag. This region in the middle of Norway is described under the Norwegian names of the two counties composing it, Nord-Trøndelag and Sør-Trøndelag.

Trondhjem OR TRONDHEIM. Third city of Norway, seaport, and principal town of Sør-Trøndelag. It is situated at the mouth of the river Nid, on Trondhjem Fjord, 240 m. direct and 350 m. by rly. N. of Oslo. A fort crowns the hill of Christianssten, and a second is on the neighbouring islet of Munkholm.

Trondhjem was founded in 997 when Olaf Trygvesson built a palace. The cathedral, founded by Olaf Kyrre in the 11th century, is the most imposing church in Norway. It was built over the tomb of S. Olaf, and has a Gothic nave and choir with a Romanesque transept. Frequently damaged by fire, it has been rebuilt, added to, and restored. Since 1818 it has been the place of coronation of the kings. Notable buildings are an arsenal in the old Kongsgaard, the museums of the society of sciences, of art, industry,



Trondhjem, Norway. The port, which became an important German U-boat base during the occupation of Norway in the Second Great War. Left, the 11th century cathedral

and of fisheries, and the Stiftsgaard. Wood pulp and tobacco factories, sawmills, machine shops, shipyards, and fish-curing factories provide most of the employment, while timber, copper ore from the Rörös mines, fish, train oil, wood pulp, and cordage are the chief exports. Pop. 56,444.

Trondhjem was occupied by German troops on April 9, 1940, the first day of the invasion of Norway. The port was bombed by the R.A.F. in June, when two cruisers and a transport were hit. A U-boat base, its heavily protected pens and workshops were the targets for frequent Allied air attack; the German cruiser Prinz Eugen (*g.v.*) was seriously damaged here by the R.A.F. while undergoing repairs. In 1942 a sermon by the dean of Trondhjem against collaborators led to the mass resignation of the Norwegian clergy as a protest against the German appointment of Quisling as premier. Trondhjem was liberated with the arrival in Norway of Allied forces on May 10, 1945, after the German surrender.

Trondhjem Fjord. Inlet of the Atlantic Ocean on the coast of Norway. It runs inland about 80 m. to Stenkjaer, and, owing to the warm Atlantic drift water, is never frozen over.

Troon. Seaport and urban dist. of Ayrshire, Scotland. Situated 9 m. S.W. of Kilmarnock, with a rly. station. It is a popular resort and residential town for Glasgow. The harbour, which is well sheltered and can accommodate large vessels, contains dry docks and shipbuilding and rope-making yards. Coal is exported. Pop. 10,271.

Troop (late Lat. *truppa*, crowd). In the military sense, the fourth part of a squadron of cavalry or armour; if the former, it consists

of 40 horses and men, if the latter, of four tanks or armoured cars. Cavalry or armoured troops are usually commanded by a captain, and privates in such units are called troopers. In British artillery regiments the troop is the smallest self-contained firing unit, generally of four guns. The plural, troops, is a synonym for soldiers. A variant of the word is troupe, a company of actors or circus performers.

Trooping the Colour. British military ceremony, described under Colour, Trooping the.

Troopship. Sea-going vessel engaged in carrying troops. The British govt. maintains a few ships specially built for this purpose, but when large numbers of troops have to be moved in wartime, it is customary to requisition privately owned vessels such as passenger liners. These are generally called transports.

Tropacocaine. Alkaloid obtained from Java coca and also prepared synthetically. It is a powerful anaesthetic and is used in place of cocaine, over which it has the advantage of being more stable in solution; also the solution can be sterilised by boiling. Tropacocaine is used for operations on the eye and for intraspinal anaesthesia.

Tropaeolum. Annual and perennial plants of the family Tropaeolaceae. They are natives of S. America, introduced into Great Britain in 1596. They are all easy of culture in any ordinary garden soil, the best-known species being the popular nasturtium, *T. majus*, with its dozens of brightly coloured garden varieties, and the canary creeper, *T. peregrinum*. See Indian Cross.

Trope (Gr. *tropos*, turn). In rhetoric, a deviation from the plainest form of speech for the sake of greater effect. The ancient rhe-

toricians restricted the use of the term to the substitution of one word for another, as in metonymy, metaphor, and synecdoche; but it is now generally applied to all figures of speech whose form is intentionally more than usually striking, including antithesis, apostrophe, asyndeton, epigram, hyperbole, innuendo, irony, litotes, or meiosis, and polysyndeton. *Pron.* troap.

Trophy (Gr. *tropē*, defeat). Originally, a memorial of victory dedicated to Zeus by the Greeks after a successful battle. It generally consisted of the trunk or branch of a tree, upon which were hung captured weapons and other spoil. This developed later into a monument in metal or stone with symbolical statues and bas-reliefs.

Tropical Diseases. Illnesses due to infection by parasites, animal or vegetable, which are either confined to hot countries or occur only exceptionally in temperate and cold countries. Research in tropical medicine is pursued in laboratories and hospitals all over the world, and special training is given in such institutions as the London School of Tropical Medicine and Hygiene. See Bilharziasis; Cholera; Delhi Boil; Dengue; Dysentery; Framboesia; Kala-Azar; Leprosy; Malaria; Plague; Yellow Fever.

Tropical Year. Period between two successive vernal equinoxes, i.e. between two successive passages of the sun across the first point of Aries. Its length, 365 days, 5 hrs., 48 mins., is shorter than the sidereal year because of the precession of the equinoxes. The tropical year is that of ordinary chronology and the Christian calendar, as it ensures that seasons recur at the same dates.

Tropic Bird (*Phaethon*). Group of marine birds, including about six species, which rather resemble large terns. They are swift fliers and are notable for two long feathers in the tail. The general colour of the plumage is white, more or less barred and marked with black.

Tropics. Two parallels of latitude, one $23\frac{1}{2}^{\circ}$ N. and the other $23\frac{1}{2}^{\circ}$ S. of the equator. The name is also given to that part of the earth's surface lying between these lines. If the axis of the earth were exactly at right angles to the plane of the ecliptic, the sun would never be seen overhead at noon except at the equator. It is because the earth's axis is tilted that the sun appears to migrate

into the N. hemisphere in the N. summer and vice versa.

The most northerly limit of the sun's migration is reached on June 21, when it is seen overhead at the tropic of Cancer, the parallel of latitude $23\frac{1}{2}^{\circ}$ N. of the equator. On Dec. 21 the southern limit, the tropic of Capricorn ($23\frac{1}{2}^{\circ}$ S.), is reached. The words Cancer and Capricorn are used because in June the sun appears to enter the constellation of Cancer, and in Dec. that of Capricorn. Between the tropics lie the great equatorial forests, tropical grasslands, and hot deserts. See Equator.

Tropine. White crystalline basic substance, $C_8H_{15}ON$, formed when atropine is boiled with baryta water. See Atropine.

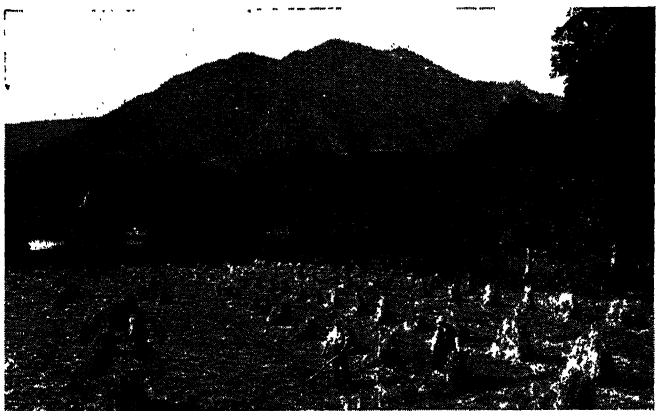
Troposphere. Term first applied by Teisserenc de Bort to the lowest region of the atmosphere, where the temp. normally falls with increase of altitude. This lapse rate of temp., taken as positive for an upward decrease, is slightly greater in summer than in winter and has a mean value of approx. 3° F. per 1,000 ft. Diurnal variation of temp. is confined to the surface layers, disappearing between 3,000 and 6,000 ft. The tropopause, or upper limit of the troposphere, varies with atmospheric conditions and lat.; on the average, in lat. 50° it is 6-7 m. above sea level. Since the lapse of temp. is continued up to the level of tropopause a high tropopause corresponds to a low temp. in the lower stratosphere (the region above the troposphere) and vice versa. This temp. lapse is of fundamental importance in determining the vertical stability of the atmosphere. A negative lapse is termed an inversion. Nearly all

clouds, and certainly all weather phenomena and precipitation, are confined to the troposphere. See Stratosphere; Temperature.

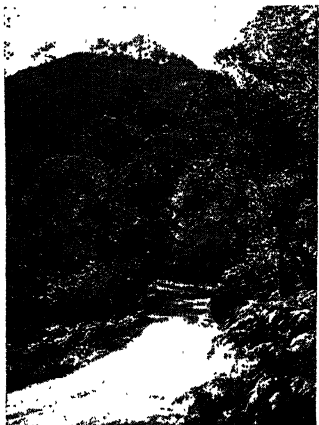
Troppau. Town of Czechoslovakia, its Czech name being Opava. It is better known in Europe by the name it bore as part of the Austrian empire. It stands on the Oppa, 27 m. N.E. of Olmütz (Olomouc), and thus was in the territory annexed by Germany in 1938. The buildings include the church of S. Mary, a Gothic edifice of the 15th century, and the chief industries are making woollens, clothing, and machinery. It was founded in the 13th cent. Pop. 30,105.

The congress of Troppau was a conference of representatives of five European powers held Oct.-Nov., 1820, which met at the instigation of Metternich to discuss the affairs of Naples, where a revolution had just taken place. Austria, Russia, and Prussia signed a protocol threatening any state which, like Naples, changed its form of govt. by revolutionary means with exclusion from the European concert and, if other states were disturbed by such proceedings, with armed force. Great Britain, but not France, protested. The conference adjourned to meet at Laibach (*q.v.*), 1821.

Trossachs, THE (Gael, bristling country). District of Perthshire, Scotland. It lies in the parish of Callander, and is a mt. pass stretching W. from Loch Achray to Loch Katrine, dominated by Ben Venue, 2,393 ft., and Ben A'an, 1,850 ft. The rough steep sides of the hills are thickly wooded. The dist. is associated with Scott's Lady of the Lake, and many tourists visit the picturesque scenery of



Trossachs, Scotland. Ben Venue seen from across Loch Achray, from which it rises 2,393 feet



Trossachs, Scotland. The road through the pass, one of the most picturesque districts of Scotland

the defile. See Achray, Loch; Ben Venue; Callander; Lomond, Loch; Perthshire.

Trotsky, LEON (1877-1940). Name assumed by the Russian Bolshevik leader Lev Davidovich



Leon Trotsky, Russian Bolshevik leader

Bronstein. Son of a Jewish chemist, he was born in the Kherson government and educated at Odessa. In 1899 he was arrested at Odessa as a member of the S. Russian

workmen's league, and banished to Siberia for four years, but escaped in the third year of his exile, and joined Lenin in London. During the attempted revolution in Petrograd, 1905, he was president of the Petrograd council (soviet) of workmen, was again arrested, and banished to Siberia, the sentence being for life. Within six months he escaped, and for some years lived in France, Switzerland, and elsewhere, supporting himself by journalism.

At the outbreak of the First Great War Trotsky was in Paris, where he edited a Russian Socialist paper. He was expelled from France in 1916, and was for a time in New York. After the March Revolution of 1917 he set out for Russia, was arrested by the British authorities at Halifax, but ultimately allowed to proceed. He joined Lenin, and was a chief protagonist of the successful revolution of Nov., 1917. On Nov. 8 he, with Lenin, seized the reins of government and established the council of the people's Commissars,

Lenin being its president, and Trotsky commissar for foreign affairs. In 1918 he became commissar for war, holding this post until 1925. With the death of Lenin in 1924 Trotsky's influence declined, and Stalin gradually ousted him from all his posts. In 1927 he was expelled from the party, and in 1929 he left the country. Later he lived in France, and in 1937 settled in Mexico. Attacked on Aug. 20, 1940, by one Jason-Mornard, Trotsky died in Mexico City the following day. His *History of the Russian Revolution, 1929-30*, is a book of outstanding value. See *Bolshevism*; *Russia*; *Soviet*.

Trotting. Form of horse-racing. In modern trotting races the horse is driven in a sulky having two bicycle wheels 28 ins. in diameter with pneumatic tires; this racing machine weighs only about 25 lb. Races are run in heats, and a horse has generally to win three heats to be declared the winner of a race. The ideal trotting-ground is an oblong-shaped track with rounded ends, either half a mile or a mile in circumference, and the record time is a little under two minutes for a mile. Mud tracks are most prevalent in America.

Horses have two styles of trotting gaits—trotting proper, in which the off fore and near hind legs strike the ground simultaneously; and pacing, in which action the two legs on the same side act together.

Trotwood, BETSEY. Character in Dickens's novel *David Copperfield*. She is David's paternal aunt, who becomes a second mother to him. Though she masks her kindness of heart behind an abrupt, uncompromising exterior, she is a woman of character, humour, and real sense, she is one of the few sympathetic persons among the author's female eccentrics. Her home is on the cliffs at Dover, where she wages perpetual war with donkey-boys.

Troubadour. (Prov. *trobador*, from *trobar*, to invent). Name given to a class of medieval poets, chiefly



Troubadour accompanying himself on a fidel

From a 14th century sculpture, church of S. Denis, Paris

increasingly artificial. Among the kinds of poem they cultivated were the *canzone* (q.v.), the *sirventes* or service song, the *alba* or dawn-song, the *planh* or lament, and the *tenson* or dispute. They usually accompanied themselves on the fidel, a five-stringed instrument played with a bow, somewhat resembling the later viol.

The troubadours were often men of good social position. They exerted a remarkable social and political influence. Their lyrics were mainly addressed to married ladies, who were the objects of a conventional devotion expressed in extravagant language, but this cult was of great importance in developing the chivalrous and romantic conception of love, and refining the relations of the sexes. The troubadours also made poems in praise of their lords, and some chose political, elegiac, satirical, and religious themes. Among the most eminent were Bernart de Ventadour, Bertran de Born, and Marcabrun. There were also troubadours in Italy and N.E. Spain; the German Minnesingers (q.v.) owed much to them, and



Trotting. A race in progress at Goshen, New York. The light bicycle-wheel carriage has a weight of only about 25 lb.

their influence on the later poetry of Europe was far-reaching. About 400 troubadours are known, and several medieval collections of biographies exist.

Troubridge, SIR THOMAS (c. 1758-1807). British sailor. Commissioned in the frigate *Seahorse*, as Nelson also was, in 1773, he served in the E. Indies. Captured by the French in 1794, he was freed as a result of the Glorious First of June, and in command of the *Culloden* he fought at the battle of St. Vincent, 1797. He was made a baronet in 1799 and was lord of the Admiralty, 1801-04. Next year he hoisted his flag in the *Blenheim* and sailed for the E. Indies. The *Blenheim* was lost off Madagascar in Feb., 1807, and the admiral was presumed drowned.

His great-grandson, Vice-Admiral Sir Thomas Troubridge (1875-1949), commanded H.M.S. *Nelson* and the aircraft-carriers *Furious* and *Indomitable* in the Second Great War, serving in Norwegian, Madagascan, Mediterranean and N. African operations. He was 5th sea lord (air) 1945-47.

Trough. Originally, a depression between two ridges, e.g. the space between the crests of two waves. By extension, a trough in meteorology means a region of low pressure on the weather map.

Trousers (Fr. *trousses*, bundles, breeches). Masculine garment, covering the lower part of the body and legs to the ankles. Worn in ancient times by the nations of N. and Central Europe, as well as the Phrygians and Persians, they were occasionally used in Rome from the 2nd century. Beau Brummel is said to have introduced trousers into England. The type worn in the days of the Regency was fastened to the foot by a strap passing under the instep. The trend of fashion since then has been towards a wider and looser style, seen in its most exaggerated form

in the so-called "Oxford bags" of the 1920s. The fashionable centre "crease" was introduced in the 1890s. Various types of employment called for special types of trousers, e.g. the corduroys of the navy, often looped up by straps below the knee, and the wide-bottomed trousers of sailors, easy to roll up. From about 1912 the trousers of lounge suits were made with the ends permanently "turned up." Trousers have frequently been made of a different material from the coat and vest to form a contrast. Between the two Great Wars, women began to wear trousers, or "slacks," on informal occasions or for work. See *Breeches*; *Costume*; *Pyjamas*; *Sansculottes*.

Trout (*Salmo fario*). Fresh-water food fish of the family Salmonidae. It is a native of the rivers that flow into the N.E. Atlantic, the Mediterranean, Caspian, and Black Seas. It has a rather short and compressed body, a small well-shaped head with blunt conical snout, and is clothed with rounded scales marked with concentric lines of growth. The colour of the upper parts is a greenish brown, paling below to a dirty white. The dorsal fin is nearly central, and as in the salmon (q.v.) there is a small appendage (adipose fin) of fatty tissue between the dorsal and the tail fins. On the lower side are a pair of pectoral or breast fins just behind the gill covers, a ventral fin below the hinder edge of the dorsal, and the anal fin below the adipose. Head and sides, as well as back and tail fins, are dotted with round or X-shaped black spots.

Trout in size and weight vary considerably in different streams or in the upper and lower reaches of the same stream. Corresponding differences are found in the flavour and the colour of the flesh. Average length is a foot and weight from $\frac{1}{2}$ lb. to 2 lb., but there are numer-

ous records of trout weighing 12 or more lb.; and one taken in Loch Stenness, Orkney, measured 3 ft. 2 ins. and came to 30 lb.



Trout. Common or brook variety found in European streams and rivers

Owing to the great variability of the trout, systematists have given species names to over 20 forms, but modern authorities incline more to the view that most of these are either local races or inconstant variations found in immature or poorly fed fish. Trout live in running, clear streams, or in the lakes from which such streams originate. Like salmon, they seek the shallow upper waters for spawning, and in these journeys—performed in autumn—they will leap out of the water in order to pass over weirs and small waterfalls. The female begins to breed when 7 or 8 ins. long, and deposits her eggs under stones or in excavated gravel much as the salmon does. At this season trout become black and shiny and unfit for food; they do not recover condition until late in spring. Their food consists of crustaceans, insects, snails, worms, the eggs of salmon and other fishes, and small fishes. The common trout is sometimes known as brown trout, river trout, and by other names. The salmon or sea trout is sometimes considered distinct on account of its larger size and its migrations to the sea. See *Angling*; *Bull Trout*; *Fly Fishing*; consult also *A History of Fly Fishing for Trout*, J. W. Hills, 1921; *Trout-Fishing on Hill Streams*, R. Clapham, 1947.

Trouvère (Fr. *trouver*, to discover). Name for a class of courtly lyrical poets of the Middle Ages in N. and central France and England. Most of the trouvères, who first appeared about 1140, were imitators of the troubadours, but wrote in the *langue d'oïl*, and confined themselves to amatory subjects. See *Troubadour*.

Trouville. Town of France, in the dept. of Calvados. It lies at the mouth of the Touques, on the right bank, 10 m. S. of Havre, with Deauville (q.v.) on the left bank, the two forming practically one town. It is 132 m. by rly.

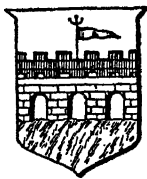


Trout. Varieties of artificial flies used in dry-fly fishing. Left to right: top row: Greenwell's Glory; March Brown (female); Cooch-y-Boddu; Welshman's Button; Sedge; bottom row: Spent Gnat; Black Zulu; Ten Black; Green Midget

from Paris, and a boat service runs to Havre. Fishing is carried on from the small harbour. A fashionable summer resort, it owes its fame to the number of French artists and men of letters who frequented it. In German occupation from June, 1940, Trouville was liberated Aug. 24, 1944, by Belgian troops of the British 2nd army, who had reached the town Aug. 22.

Trovatore, *Lt.* (It., *The Troubadour*). Opera in four acts with libretto by Cammarano, and music

church of S. James, restored in 1546 and 1848, contains interesting monuments, including that of George Crabbe the poet, who was rector here, 1813-32. The town hall, with a lofty clock tower, is partly Elizabethan, and contains the sessions court. The principal industry is woollen manufacture, established since the early 16th century. Market days, Tues. and Sat. Pop. 14,000.



Trowbridge arms

Troy. Ancient city in Asia Minor. Immortalised in Homer's *Iliad* as Priam's citadel, whose capture was the objective of the Trojan War, its site was disputed even in antiquity. It was finally identified in 1893 by W. Dörpfeld's excavations, completing H. Schliemann's in 1870-82, on the ruin-mound of His-

sarlik, 162 ft. high, and $3\frac{1}{2}$ m. from the Dardanelles mouth.

The excavations, at first somewhat ruthless and unsystematic, ultimately revealed nine superimposed layers of debris. (1) A small Neolithic settlement of hut-dwellers built rough stone walls on the virgin rock, used stone implements, and produced primitive hand-made pottery. (2) A more advanced stronghold of the early Metal Age had gated walls and towers of cyclopean masonry, with sun-dried brick houses of early Aegean type. Thrice rebuilt, the traces of fire on the topmost level led to its being called the burnt city. It yielded an extraordinary hoard of silver jars, gold daggers, and diadems, hailed at first as Priam's treasure. (3-5) Three successive occupations were hardly more than village farmsteads.

(6) Upon these pre-Mycenaean foundations arose about 1500 B.C. a substantial citadel, covering five acres, with massive gated walls of ashlar, wells, brick houses, and painted pottery of the Mycenaean Age. This was long thought to be the scene of Homer's Troy, but the American excavations begun

in 1932 showed that it was destroyed by earthquake about 1300 B.C. (7a) The Homeric city, which came to a violent end in the 12th century B.C. (7b) A settlement of European intruders, ushering in the early Iron Age. (8) After the visit of Alexander the Great the debris of Priam's city was removed from the summit, and New Ilium arose. Strengthened by Lysimachus, and enriched with Hellenistic sculpture, it was destroyed by the Roman legate Fimbria in 85 B.C. (9) Julius Caesar's visit led to its rebuilding, with a temple of Athena and there Greco-Roman features.

The strategic importance of Homer's Troy lay in its control of the Dardanelles outlet of the Black Sea trade. Hence the Trojan plain became a mart for exchanging the produce which converged along four trade routes, traversing the Thracian coast, the S. coast of the Euxine, the Phrygian hinterland, and the island route from Lycia. The fall of Troy opened the Euxine to Greek trade and colonisation, weakened the Lycian supremacy, and made Greece paramount in the Aegean. Influenced by its former greatness, Constantine chose it as the site of New Rome; the abandonment of this project in favour of Byzantium sounded for ever the death-knell of Priam's ancient heritage. See Aegean Civilization; Archaeology; Homer; *Iliad*; Priam; consult also Schliemann's Excavations, C. Schuchhardt, trans. E. Sellers, 1891; Troy, A Study in Homeric Geography, W. Leaf, 1912; Dawn of European Civilization, V. G. Childe, 4th ed. 1947.

Troy. City of New York state, U.S.A. Capital of Rensselaer co., it extends 7 m. along the Hudson at the head of navigation, and is 6 m. N.E. of Albany. Communications are provided by several rlys. and the state barge canal. The Rensselaer Polytechnic Institute is one of the finest institutions of its type in the U.S.A. Important manufactures are shirts, collars, and cuffs, a detachable collar having been invented by a Troy housewife in 1825. Other manufactured articles include laundry machinery, stoves, and ventilators. Settled in 1659, Troy was chartered as a city in 1816. One of the U.S. earliest labour unions was started here in 1868. Pop. 70,304.

Troyes. City of France. It stands on the left bank of the Seine 103 m. S.E. of Paris, being the capital of the dept. of Aube. The chief building is the cathedral of S.



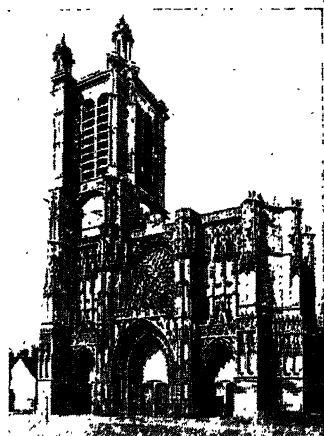
Trowbridge, Wiltshire. Market Hall and, left, the Town Hall with its clock tower, 101 ft. in height
Frith

by Verdi. Based on a lurid story of a gipsy's vengeance in medieval Aragon, it contains much descriptive and lyrical music. First produced at Rome, Jan. 19, 1853, it became immediately popular and was later one of the standard works in Italian operatic repertory. It was first given at Covent Garden, May 17, 1855.

Trover (Fr. *trouver*, to find). English legal term. Form of action from which the action for conversion developed. Originally an action of trover could be brought where one person found goods lost by another and converted them to his own use. Soon the losing and finding became mere fictions, and trover was used wherever one person converted the goods of another, as by doing any act in relation to the goods which amounted to a denial of the title of the true owner. A person who sells goods which he has on hire purchase may thus be sued for conversion.

Trowbridge. Urb. dist. and market town of Wiltshire, England. It is 11 m. S.W. of Devizes, has a rly. station, and is served by a canal. The fine Perpendicular

Peter, a 13th century building, famous for its choir and other objects of medieval art. The city has other fine old churches, notably those of S. Urban, S. John, S. Nicholas, and La Madeleine, each with notable decorations, glass, or relics; some suffered bomb damage in the Second Great War. The abbey of S. Loup is now a museum and library, while the buildings of another abbey are used by the municipality. Secular buildings include the hôtel de ville and the



Troyes, France. West front of the cathedral of S. Peter, completed, except for the S. tower, in the 16th cent.

Hôtel Dieu (also slightly damaged). There are a number of fine old houses. The chief industry is the manufacture of hosiery, and there is a trade in wine. It was the seat of a bishop about 400, and in the Middle Ages one of the richest cities in Champagne, famous for its fairs. Pop. 58,805. *Pron.* Trwa.

Troyes, TREATY OF. Name given to two treaties between England and France. The first was concluded May 21, 1420, between Henry V of England, Charles VI of France, and the Burgundians. By its terms Henry gave up the title of king of France, but was to marry Charles's daughter, Catherine, have the title of regent and heir of France, and succeed to the throne of France on Charles's death. Normandy and all Henry's conquests were to be restored to France on Henry's accession to the French throne. The dauphin was to be disinherited. The second treaty was signed in 1564, after the English surrender of Havre. By it France undertook to pay England 120,000 crowns and free trade was to be allowed between the two countries.

Troyon, CONSTANT (1810-65). French painter. Born at Sévres, Aug. 28, 1810, he studied under

Riocreux, keeper of the porcelain factory, and Poupart, exhibiting at the academy from 1833. At first purely a landscape painter, he began about 1849



Constant Troyon, French painter

to introduce animals into his works, and became one of the greatest animal painters. Closely associated with the Barbizon group, he obtained substantial material reward, though he died insane in Paris, Feb. 21, 1865. He is well represented in the Louvre.

Troy Town. Name given to Fowey, Cornwall, in the fiction of Sir A. Quiller-Couch (*q.v.*). The name first appeared in *The Astonishing History of Troy Town*, 1888, but was later used in other of his novels and short stories. While it purported to be a fictitious town, the disguise was thin, and its identity with Fowey was soon assumed.

Troy Weight. Measure used in the U.K. Introduced probably from Troyes, France, early in the 15th century, it was legalised as standard for weighing gold and silver in 1527. By an Act of Henry VIII the weight of the pound troy was fixed at 5,760 grains. But by the Act of 1878 troy weight was abolished with the sole exception of the troy ounce, its decimal parts and multiples, to be used for the sale of gold, silver, platinum, and precious stones. The ounce was divided into 20 pennyweights, each of 24 grains. *See* Weights and Measures.

Truancy (Welsh *truau*, wretched). Absenting oneself from school without permission. Under the Education Acts for England, a parent is held *prima facie* responsible for his children's attendance at school, and the education authority may serve on the parent a school attendance order in respect of a child.

Truce (A.S. *treow*, compact). Term used for a suspension of hostilities, usually for a definite time. In the Middle Ages truces were frequently made for periods of years. A flag of truce is carried by those who are sent to an enemy to ask for a cessation of hostilities. *See* Armistice; White Flag.

Truce of God. In medieval times, the prohibition by the Church of hostilities during certain specified times with sacred associations. Thus it was forbidden to wage war from Thursday evening until Sunday evening, on certain

feast days, and in Advent and Lent. The first proposal for a truce of God was made at the council of Charroux, 989, and during the 11th century it was widely observed in France, Italy, and Germany. Penalty of excommunication for breach of the truce was later imposed.

Trucial Sheikhs. Rulers of seven Arabian sheikhdoms occupying 400 m. of the coast of the Persian Gulf between Sha'am and Khor el Odeid, formerly called the Pirate Coast, now known as the Trucial Coast. From 1820 Great Britain ensured the suppression of piracy and the slave trade here. Pop. est. 95,000 (10,000 nomads).

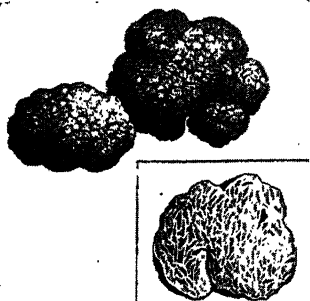
Truck Act. This Act of the U.K. (1831) made it illegal for an employer to pay workmen for their services in goods instead of cash.

Trueba y la Quintana, ANTONIO DE (1821-89). Spanish novelist and poet. Born at Sopuerta in Biscay, Dec. 24, 1821, he abandoned commerce for journalism and literature, and wrote a series of sentimental tales, historical novels, and songs. His works include *El Cid Campeador*, 1861, and *Cuentos Campesinos*, 1865. Trueba died March 10, 1889.

True Case. British murder trial. On March 6, 1922, Ronald True (b. 1891) battered to death Gertrude Yates, known as Olive Young, in her flat at Fulham, S.W. London. He was arrested that evening in a theatre at Hammer-smith. True, whose record was coloured by megalomania, a persecution complex, and addiction to drugs, had told acquaintances that he would kill somebody in a Fulham flat on the day in question; he stayed in the flat with the corpse until after the charwoman arrived; so there could be no plea of not guilty, and at the trial before Mr. Justice M'Cardie on May 1-5, Curtis-Bennett defended him on the ground of insanity. The jury convicted, and an appeal was dismissed; but in view of medical testimony that True was certifiably insane, the Home secretary, acting on the Criminal Lunatics Act, 1884, appointed a medical commission to examine him. Their report unanimously confirming this evidence, True was sent to Broadmoor. Popular indignation at this reprieve, in view of the recent execution of Jacoby (*q.v.*), was such that the Home secretary made a speech in the commons to prove that he could not legally have acted otherwise than he did.

Truffle (*Tuber aestivum*). Underground edible fungus, belonging to the Ascomycetes (*q.v.*), and the

family Tuberaceae. The spore-bearing body is potato-like, irregularly round, with a blackish-brown exterior covered with hard warts. The interior flesh is at first white,



Truffle. The underground fungus eaten as a delicacy. Inset, section

then brown, with irregular cavities in which the large netted spores are produced. Its taste is rather insipid, and the smell suggests yeast. Truffles occur just below the surface of the ground in woody places. As there is no above-ground indication of their presence, pigs and dogs are trained to hunt for truffles by scent. The famous Périgord truffle is a distinct species (*T. melanosporum*).

Trujillo. State of Venezuela, touching Lake Maracaibo on the W. Its capital has the same name and is on the Trans-Andean highway, about 45 m. E. of the lake port of La Ceiba. The state is one of the leaders in output of Venezuelan cocoa, and near the capital coffee, sugar, maize, and tobacco are also grown. There are flour mills and a refrigeration plant. Pop., state, 264,270; town, 18,254.

Trujillo (Lat. Turris Julii). Town of W. Spain, in the prov. of Cáceres, Estremadura. It is situated in a mountainous dist., 24 m. E. of the city of Cáceres on the main road from Madrid to Portugal, and 44 m. by road S. of the rly. station of Navalmoral. The tomb of Pizarro, conqueror of Peru, born at Trujillo, is in the church of Santa Maria de la Concepción. Among Roman ruins in the neighbourhood is the Tower of Julius. Chocolate, linens, pottery, and leather are manufactured, and there is trade in wheat, wine, oil, and fruit. Pop. 15,000.

Trujillo or **TRUXILLO.** Seaport of N. Honduras. It stands on the Caribbean coast, 137 m. N.N.E. of Tegucigalpa. It was founded in 1523, and was for a time a flourishing port and capital of the republic. Trade has revived with the export of bananas to the U.S.A. Pop. 7,547.

Trujillo or **TRUXILLO.** City of N.W. Peru, capital of the prov. of Libertad. It is 320 m. N.W. of Callao, 1½ m. from the coast, with rly. connexions to its port, Salaverry, and to Huanchaco. The 17th century walls still stand, and the chief buildings are the cathedral, the university, and a seminary. Sugar, rum, tobacco, and coffee are the principal products. The ruins of the Inca city, Gran Chimú, are in the vicinity. The city was founded in 1535 by Pizarro (born at Trujillo, Spain) and was destroyed by earthquake in 1619. Pop. 30,000.

Trujillo. Cap. of the Dominican Republic. See Ciudad Trujillo.

Truk. Island in the Pacific Ocean. One of the Caroline group, it was in German possession 1889-1914, when Japan occupied it. It was later placed by the League of Nations under Japanese mandate. Contrary to the terms of the mandate, Japan developed Truk into a strong air and naval base. For its part in the Second Great War, see Caroline Islands. With other Japanese mandated islands it was placed under U.S. administration by the U.N., 1947.

Trullan Councils. Name given to two church councils held in Constantinople (now Istanbul) in 680 and 692. The name is derived from the *troullos*, or domed hall, in the imperial palace where they were held. The first was the 6th oecumenical council, which condemned the Monothelite heresy. The second, also called the Quinisext council, was not acknowledged by the Western Church. It issued 102 canons, and permitted the marriage of priests.

Truman, HARRY SHIPPE (b. 1884). Thirty-second president of the U.S.A. Son of a horse dealer, he was born at Lamar, Mo., May 8, 1884, and brought up as a farmer. He had a high school education and served on the Meuse-Argonne front in the First Great War. A Democrat, after being road overseer, tax collector, postmaster, he was appointed county court judge in 1922 (all these appointments being political in the U.S.A.). He studied law at Kansas City 1923-25, and was a presiding judge 1926 until elected to the senate for his native state in 1934; he was re-elected in 1940. The political corruption in Missouri at that time never touched Truman personally. But he did not forget that he owed his career to "Boss" Prendergast; and, when that politician died after serving a term of imprisonment, Truman, al-

though by then vice-president, attended his funeral. During his first term as senator, Truman served on a committee appointed to investigate rlys.; in 1941 he was made chairman of a special committee examining national expenditure which, after the U.S.A. became involved in the Second Great War, exercised a powerful check on waste and corruption in the carrying out of war contracts.

Chosen to run for the vice-presidency with Roosevelt in his fourth candidacy, Truman succeeded to the presidency on Roosevelt's death, April 12, 1945. The oath was administered to him in the name Harry Shippe, but he responded Harry S. After Germany's surrender, he represented his country at the Potsdam Conference (*q.v.*), July-Aug., 1945. He gave the order to drop the first atomic bomb on Hiroshima, Aug. 6, and announced its use to the world from the White House 16 hrs. after it had fallen.



Harry S. Truman, President of the U.S.A.

Truman had pledged himself to carry out his predecessor's domestic and foreign policies; but his pronouncements and actions as president-by-chance were marked by changes of mind which created national and international uncertainty in a critical period and led his own party in 1948 to seek feverishly, but in vain, for some other "strong" presidential candidate. Against the forecast of all political experts and public opinion polls he was elected president in Nov., carrying 28 states with 304 seats in the electoral college against T. E. Dewey's 16 states with 189. Truman won in spite of a revolt against the Democratic party in four southern states over his call for full civil rights for all U.S. citizens, the loss of New York state (carrying 47 electoral seats)

to the Republicans, and a poll of less than 50 p.c., though a low poll usually favours the Republicans. The popular vote for Truman was 23,667,727. See N.V.

Trumbull, JONATHAN (1710-85). American patriot. Born at Lebanon, Conn., Oct. 12, 1710, and educated at Harvard, he studied theology and law and held various posts in the legislature of his state, of which he was governor, 1769-83. He was the intimate friend and valued counsellor of Washington, whose frequent remark, "Let us hear what brother Jonathan has to say," is supposed to have been the origin of the popular nickname for the American people. Trumbull died at Lebanon, Aug. 17, 1785. His son John (1746-1843) was a distinguished painter.



After John Trumbull

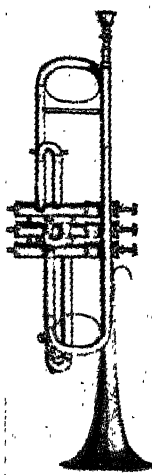
Trumper, VICTOR THOMAS (1877-1915). Australian cricketer. Born at Sydney, Nov. 2, 1877, he played for New South Wales and represented Australia in test matches against England and South Africa. During the Australian tour of 1902 he totalled 2,570 runs, then the highest aggregate obtained by an Australian in England. Altogether in test cricket he scored 2,263 runs with an average of 32.79, and six times exceeded the century, his best effort being 185 not out at Sydney in 1903. He died June 28, 1915, leaving the reputation of one of the most exciting batsmen known to the game.



Victor Trumper, Australian cricketer

Trumpet. Musical instrument which, in various forms, is of great antiquity. The modern trumpet consists of a cylindrical brass tube, which becomes conical as it widens out towards the bell. It is bent so as to make it convenient for holding. Originally it could produce only the notes in the harmonic series of the key in which it was pitched, necessitating the use by the player of different crooks whereby the length of the tube could be altered.

These crooks gave the keys of F, E, E flat, and D, all of which



Trumpet used in military bands
Boosey & Hawkes

be altered by a semi-tone or a tone without change of crook. The modern trumpet is fitted with valves (see Cornet; Horn), so that any note can be obtained within the compass.

Simple trumpets, without slide or valve, are used by British cavalry units, artillery regiments, and the R.A.F. for sounding salutes and calls, instead of the bugles used by infantry and the Royal Navy. The principal trumpet calls are royal salute, air salute, reveille, retreat, first post, tattoo, last post, lights out, and alarm.

Trumpeter (*Psophia*). Genus of S. American birds, nearly allied to the cranes. They resemble cranes with a shortish neck and the head of a domestic fowl. The plumage is usually black with greenish reflections on the back and bluish grey beneath. They occur in large companies in the forests, feeding on fruit, grain, and



Trumpeter. Loud-voiced bird, found in South American forests

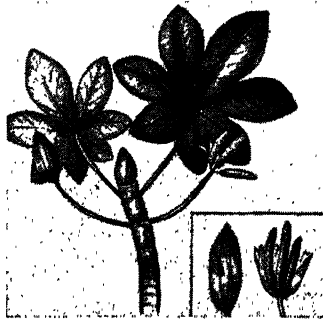
insects; and have a loud trumpet-ing note. The name is also given to a rare swan of N. America.

Trumpet Flower. Popular name of climbing shrubs belonging to the genus *Bignonia*. See *Bignonia*; *Tecoma*.

sounded higher than the notation of C in which the part was written. With the C crook, the notation and the pitch were in unison; with the B flat crook, the sound was a tone lower. Even with the crooks, however, there were inevitable lacunae in the scale. The first notable attempt to remedy this defect consisted of an adaptation of the slide principle (see Trombone), by which the pitch could

Trumpet Major. Non-commissioned officer in the British army. Having been in disuse for many years this title was revived in 1928, replacing sergeant-trumpeter. The Trumpet Major is the title of one of Hardy's novels, set in the time of the Napoleonic wars.

Trumpet Tree (*Cecropia peltata*). Evergreen tree of the family Moraceae. It is a native of tropical



Trumpet Tree. Leaves and flower spikes; inset, flower spikes

S. America and the West Indies. The hollow branches are used as musical instruments.

Trunk Road. Highway forming part of a national system of routes for through traffic. For this class of roads in Great Britain, brought into being by the Trunk Roads Act of 1936, the ministry of Transport was made responsible (local councils being formerly responsible for all roads in the area under their authority).

Truro. Episcopal city, mun. bor., and market town, giving its name to a co. constituency of Cornwall, England.

On the Truro river, a branch of the Fal, it is 11 m. N. of Falmouth, with a rly. station and a steamer service to Falmouth.



Truro arms

The junction of Boscawen and Lemon Streets is Cornwall's busiest traffic spot. Truro became a bishop's see and a city in 1876. The cathedral was begun in 1880, the old parish church of S. Mary forming the S. aisle. The building is in E. E. style, designed by J. L. Pearson; the nave was completed 1903, the central and W. towers by 1910. Adjoining the S. transept is a circular baptistery commemorating Henry Martyn the missionary, a native of Truro. Also born here were the brothers Lander, African explorers. The grammar school dates from 1549 and the market hall from 1847. The museum and art gallery contains Phoenician and ancient



Truro, Cornwall. Cathedral of St. Mary. It was built, 1880-1910, on the site of the old parish church

Cornish remains. There are pottery works and other factories. Market days, Wed. and Sat. Pop. approx. 13,000.

Truro. Town of Nova Scotia, Canada. The co. town of Colchester, it is 2 m. from the sea at Cobequid Bay, and 62 m. N.N.E. of Halifax. Truro was founded in 1761, and is a rly. centre, being on the C.N.R. and Dominion Atlantic rly. Pop. 10,272.

Truss. In engineering, a supporting frame or structure used for spanning a space between supports. Such structures are chiefly used in the construction of bridges and roofs. See Bridge; Roof.

Truss (Fr. *trousse*, bundle, truss). Apparatus applied externally to the body for the prevention or control of hernia (*q.v.*).

Trust (Old Norwegian *traustr*, strength). In English law, a confidence reposed in a person so that he may hold certain property for the benefit of some other person or object. Trusts may be either express, i.e. where the trust has been created; or implied, where a person holds property in circumstances in which he is bound in equity to hold it for the benefit of some other person. Another classification divides trusts into public and private. Public trusts are usually charitable, private for the benefit of individuals. A person may declare himself a trustee of his own property, or may transfer the property to other persons to be held on trust by them. (See National Trust.)

In commerce and industry the word trust is used to denote the linking of a number of cos. either by the transfer of shares of the individual cos. to trustees, who issue trustee certificates, or by the exchange of shares in a holding co. for shares of the other cos., the holding co. thus securing control of the constituent cos. The object of such trusts is to eliminate competition, and thus secure total or partial monopoly and ability to control level of prices and production in a particular commodity or class of commodity. The Standard Oil co. founded in the U.S.A. by J. D. Rockefeller in 1882 with a capital of \$100 m. was a trust. Another was the German I.G. Farbenindustrie, biggest chemical combine in the world, seized by the Allied control council Oct., 1945. Such trusts, characteristic of industry during the late 19th and 20th cents., were made illegal in the U.S.A. by the Sherman Anti-Trust Act, 1890; and Theodore Roosevelt, president 1901-09, earned the title trust buster through the energy with which he fought American trusts. The U.S. supreme court in 1911 ordered the Standard Oil co. and the American Tobacco co. to disintegrate. (See Monopoly; Sherman, John; Standard Oil Companies.)

An investment trust is one formed to invest in marketable securities money subscribed by its shareholders who receive dividends from the income received through the management of the investment

fund. Some investment trusts restrict their operations to stated classes of securities.

A unit trust is a group of marketable securities, the property in which has been divided by the managers of the trust into a number of units. Members of the public can buy units in the trust, receiving a unit certificate, entitling them to a share in the net income derived from the whole of the group of marketable securities. Unit trusts are either (a) fixed, when the securities to which the unit certificates relate are known to the certificate holders and cannot be changed by the managers, or (b) flexible, when the managers have some power to vary the constitution of the portfolio of investments. The prices at which certificates in the various unit trusts can be bought or sold are advertised from time to time. Corporations must be appointed as trustees for the certificate holders, and the activities of managers of unit trusts are subject to many restrictions. By investing in a unit trust instead of directly in marketable securities the investor of a small sum of money gets the advantage of investment in a number of undertakings, thus spreading his risk.

Trustee. Person who has the legal ownership of property, but holds it for the benefit of others, who are called the beneficiaries. A trustee's business is to execute the terms of the trust strictly. If he is in doubt as to his duty in any special instance, he may take out a summons, asking a judge to direct him as to the course to be pursued. If he finds himself with trust property in his hands, and does not know to whom to pay it—e.g. if the beneficiaries or some of them cannot be found—he should transfer it to court for the court to deal with. A trustee is not entitled to any remuneration, unless the trust deed or will says he is to have it; but he may be recouped out of the trust property for any expense he may be put to. Trustees are not liable for breaches of trust if they act honestly and reasonably.

Trustee savings banks are described separately below. The term trustee stocks is used for those securities in which, by English law, trustees may invest trust funds. These include public funds and certain corporation stocks, set out in the Trustee Act, 1925.

A trustee or trust company is a corporation formed or appointed to discharge the duties of a trustee. Most British banks and insurance cos. act as trustee cos.; others

have formed special cos. to undertake trustee business.

Trustee Savings Bank. Institution, intended mainly for the small saver, established under an Act of 1863. Its assets are vested in trustees, usually local men of repute, approved by the national debt commissioners, by whom, except for such sums as are required for the daily conduct of the business, the funds deposited are held. Interest is paid on sums deposited, and each customer receives a pass book which must be produced whenever a withdrawal takes place. Cheques cannot be issued on such accounts. The funds held by these banks have increased enormously in recent years. In many they supplement the services of the Post Office savings bank and compete with the services offered to small savers by the clearing banks. See Savings Bank.

Trust House. British public house having for its object the promotion of temperance by supplying food and drink under conditions that do not encourage the sale of alcoholic liquor. The movement was initiated about 1905, the chief promoters being Earl Grey and Bishop Jayne. The system provides that the managers shall have a fixed salary, and no interest in selling alcoholic liquor, their profits coming from the sale of food and other drinks, e.g. tea, coffee, mineral waters. H.q. of Trust Houses, Ltd., are at Shorts Gardens, London, W.C.2.

Truth. In philosophy, the correspondence of perception or inference with reality. Since the dawn of Greek speculation, the question has been debated whether absolute truth is possible, or all truth is relative. Plato held that the mind naturally apprehends external verities or ideas. Later intellectualist schools, following Descartes and Spinoza, affirmed that absolute truth, e.g. in mathematics and geometry, was attainable, apart from the senses, by pure disinterested thought. The ultimate bases of truth, it was agreed, are unprovable assumptions, and the issue turns on their validity. Intellectualism tended to scepticism. Pragmatism started afresh by insisting that all thought was interested, and related to action, the test of truth being its practical consequences. Truth was only gradually attained by a succession of ventures or acts of faith, which were put to the test of experience. The philosophical view of truth is, in fact, continually being adapted to scientific discovery. See Eleatic

School; Metaphysics; Protagoras; Relativity of Knowledge.

Truth. London weekly paper. It was founded Jan. 4, 1877, by Henry Labouchere (q.v.), with the motto, *Cultores veritatis, fraudis inimici* (cultivators of truth, enemies of fraud). Giving much space to exposure of fraud, it has devoted special attention to stock exchange affairs, also to all phases of court, society, and political life, and literature, art, etc. A "queer story" has been a regular feature. Truth in general stands for constitutional procedure and free enterprise. Collin Brooks became editor in 1940. The offices are at 10, Carteret Street, W.1.

Tryon, GEORGE CLEMENT TRYON, 1st BARON (1871-1940). British politician. Born May 15, 1871, and educated at Eton and Sandhurst, he went into the army and fought in the S. African War. He entered politics in 1910, as Conservative M.P. for Brighton, holding the seat at every election. Parliamentary secretary to the ministry of Pensions, 1920, he became head of that ministry in all the Baldwin administrations, 1922-24, 1924-29, and 1931-35. Then during five years as postmaster-general, he introduced important reforms. Major Tryon was raised to the peerage in 1940, but died on Nov. 24, being succeeded by his son Charles (b. 1906) as 2nd baron.

Tryon, SIR GEORGE (1832-93). British sailor. Born Jan. 4, 1832, he entered the navy at 16, and the saw service in the Crimean War, 1854-56. He commanded the Warrior, the first British ironclad, 1861-64, and in 1867 directed transport in the Abyssinian campaign. During 1874-81 he held commands in India and the Mediterranean, and was commander-in-chief of the Australian station, 1884-87, being knighted in the latter year. Appointed commander of the Mediterranean fleet in 1891, he was engaged in manoeuvres off Tripoli when his flagship Victoria (q.v.) was rammed and sunk on June 22, 1893, with the loss of Tryon and over 300 others.

Trypanosoma (Gr. *trypanon*, borer; *soma*, body). Genus of flagellate protozoa, which are parasitic in man and other animals. In man they produce the fatal sleeping sickness (q.v.), and in mammals

the equally serious tsetse fly disease. The parasites are conveyed from one victim to another by the bite of the tsetse fly (q.v.).

Trypsin. Enzyme or ferment present in the juice secreted by the pancreas. It acts like pepsin in the digestion of proteins, converting them into simpler substances; but differs in that it acts in an alkaline instead of an acid medium, takes effect more rapidly, and carries digestion farther.

Tsaidam, CHAIDAM, OR ZAIDAM. Dist. in central Asia, in the Chinese prov. of Chinghai (Tsinghai), lying W. of Lake Koko-Nor. It is a lofty plateau, with a central depression of sandy and marshy soil.

Tsana, TZANA, TANA, OR DEMBEA. Large lake in Abyssinia, situated on the high plateau S. of Gondar, about 60 m. long by 40 m. broad. From it issues the Blue Nile, and not far N. of the lake the river Atbara has its source. The floods on both these rivers, due to heavy summer rains in the neighbourhood of the lake, are the cause of the annual flood which inundates the Nile valley. Proposals to dam the lake for hydro-electric power have to consider the risk of interfering with the seasonal flow of that river.

Tsar, TZAR, OR CZAR (Lat. *caesar*). Slav title, signifying emperor. It was used in the Middle Ages in the Balkans, the Bulgarian kings being early known as tsars, and later in Russia, where Ivan the Terrible was the first to be crowned tsar of all Russia, and Nicholas II (q.v.) the last. The feminine is tsaritsa.

Tsavo. River and settlement of Kenya Colony. The former flows E. from Mt. Kilima-Njaro, and the latter is on the Ugandan rly., 133 m. N.W. of Mombasa. Consult Man-Eaters of Tsavo, J. H. Patterson, 1911.

Tschaikowsky. Continental transliteration of the name of the Russian composer for which the form Tchaikovsky is preferred in this Encyclopedia.

Tschiffely, AIMÉ FELIX (b. 1895). Swiss traveller and author. Born May 7, 1895, he

came to England and was a teacher. Later he went to Buenos Aires as headmaster of the English high school and writing in English and



Sir George Tryon,
British sailor



A. F. Tschiffely,
Swiss traveller

Spanish for journals and magazines on both sides of the Atlantic. As a traveller his greatest exploit was his ride of 10,000 m. from Buenos Aires to Washington, D.C., which he described in his most popular book, *Tschiffely's Ride*, 1936.

Other books included *Don Roberto*, 1937; *Coricancha*, 1943; *Ming and Ping*, 1946. Tschiffely married Violet Marquesita, singer of Spanish songs.

Tsetse Fly (*Glossina*). Genus of flies allied to the house fly and belonging to the family Muscidae. Confined to Africa S. of the tropic of Cancer, these flies are prevalent in areas of forest and bush known as fly belts.

Twenty species are known, nearly all larger than the house fly, with a prominent proboscis in front of the head, used by both sexes for blood sucking. The female tsetse brings forth a single larva which is nourished within the uterus until mature. It is then deposited in a sheltered place, where it speedily turns to a pupa; and the fly issues about a month later. Researches by Sir David Bruce and others showed that certain species of tsetse are the sole carriers of the trypanosomes, or causal organisms, of sleeping sickness in man and of nagana in domestic animals. Infection and death is comparatively low among human beings; but in parts of Africa it is impossible to keep cattle, on which much of the African pop. depends for its livelihood. The tsetse is the greatest menace to the development of much of tropical Africa.

Control is exceedingly difficult; eradication of vegetation around villages has helped, since the fly needs shade and avoids areas exposed to full sunlight. Spraying with D.D.T. has been tried experimentally. Many game animals, as well as reptiles, act as natural reservoirs of infection by harbouring the trypanosomes causing the diseases named. Attempts to cure cattle by injection with a preparation called dimidium have met with some success. See also *Antrycide* in N.V. *Consult Insects of Medical Importance*. J. Smart, 1943.

Tsinan. City of China, capital of Shantung prov. Situated on a fertile plain, 4 m. S. of the Hoang-ho, to which it is joined by an excellent road. and 245 m. S. by E. of

Peking, it existed under the name of Tan c. 2000 B.C. On the Tientsin-Pukow rly., it was declared open for foreign trade in 1904, and is now also linked by rly. with Kiaochow. Close by on the E. are iron mines. Trade is chiefly in silk brocades, precious stones, and glass. There are fine temples, and an R.C. cathedral. Communists captured Tsinan in 1948 as an important junction threatening Nanking. Pop. 512,686.

Tsingtao. Seaport of China, in the prov. of Shantung. On the Bay of Kiaochow, it is connected by rly. with the Tientsin-Pukow line at Tsinan. Tsingtao was the chief town of the Kiaochow territory leased in 1898 to Germany for 99 years. Almost at once it was opened to foreign trade. In 1914 the place was defended by about 5,000 Germans and, being heavily fortified, was able, with the help of warships in the harbour, to maintain for a time a stubborn defence against combined British and Japanese attempts to capture it, Sept. to Nov. The fortress surrendered to the Japanese on Nov. 7. Pop. 756,000.

Tsitsihar. Town of Manchuria. In the prov. of Heilungkiang, it stands on the Nonni river and the Chita-Harbin rly. line. It is an important Mongol cattle market, and a centre for agricultural products for export. Pop. 81,624.

T-Square. Draughtsman's accessory for drawing parallel horizontal lines. It usually consists of a thin, flat piece of wood. At the left end a thick cross piece is rigidly secured on the under side, so that its inner edge is at right angles to the main strip. The cross bar sits firmly against the edge of a drawing-board and can be slipped upwards or downwards; the main strip is used as a ruler.

Tsu. Town of Japan. It stands on Owari Bay, in the Mie prefecture of Honshu Island, and is connected by rly. with Kyoto, 50 m. direct W.N.W. It has a number of temples, notably that of Ko-no Amida, and produces porcelain, textiles, fans, and parasols. Pop. 56,812.

Tsugaru Strait. Channel of the N.W. Pacific Ocean. It connects the Sea of Japan with the Pacific, and separates Honshu Island from Hokkaido. Length about 175 m., extreme breadth about 35 m.

Tsunamis (Japanese). In geology, so-called tidal waves caused by submarine earthquakes. Such great waves have done enormous damage and caused

great loss of life. At Lisbon in 1755 the sea, after retreating, rushed inland in a wave estimated as being 40 ft. high; and at Sanriku, Japan, a wave rising over 90 ft. was reported in 1896. See *Earthquake*.

Tsuruga. Seaport of Japan. Situated on the W. coast of Honshu, on an arm of Wakasa Bay, about 50 m. N.N.E. of Kyoto, with which it is connected by rly., it has a good harbour. In normal times passenger and cargo services are maintained with Vladivostok. Ships are built and agricultural produce and manufactured goods are exported. Heavy damage to life and property in the town was caused by the earthquake which struck Fukui (q.v.) June 28, 1948. Pop. 22,513.

Tsushima. Naval engagement between the Russians and Japanese, May 27-28, 1905. The Russian fleet, under Rozhdestvensky, after a seven months' voyage, was almost annihilated by an approximately equal force under Togo. There were 12 capital ships on either side. The advantage both in tonnage and in gun-power lay with the Russians; but this was more than offset by Japanese efficiency and by Togo's superior speed. The main action was fought in the afternoon of the 27th. After nightfall several flotillas of Japanese torpedo craft, in spite of heavy weather, were sent against the battered and scattered remnants of the Russian fleet; and on the 28th a surviving division of battleships was compelled to surrender, minor craft being rounded up and captured or destroyed. See *Russo-Japanese War*.

Tsushima Strait. S. channel of the Strait of Korea, Japan. It separates Tsushima (Tsu Island) from Kyushu and Honshu. The N. channel is called Chosen Strait. Tsushima possesses an elevated surface reaching 2,100 ft. at its highest point, and is 40 m. in length. At high water it is divided into two portions. Its area, including some 40 adjacent islands, is 271 sq. m. Pop. 44,606.

Túa. River of N. Portugal. An affluent of the Douro, it rises in the Sierra Segundera, N. of the Spanish border, and flows S. through the prov. of Tras os Montes to join the main stream below Túa, after a course of 120 m.

Tuam. City and market town of Galway, Eire. Situated 20 m. N.N.E. of Galway, with a station on the Eire state rlys., the city grew up around the abbey of S. Mary, which was made a



Tsetse fly,
natural size

cathedral by S. Jarlath early in the 6th century. It is the seat of a Protestant bishop, the 12th century church of S. Mary being rebuilt as the cathedral in 1861; also of an R.C. archbishop. Tuam Cross, in the market place, is one of the oldest and finest Irish examples. Here is a state-aided beet sugar factory. Market days, Wed. and Sat. Pop. 3,873.

Tuapse. Russian seaport on the Black Sea. In the Azov-Black Sea area of the R.S.F.S.R., it is 100 m. S.E. of Novorossiisk, and the terminus of a branch rly. to Armavir on the main line across Caucasus. Shortly before the Second Great War, Tuapse became an important oil refining centre and was also developed as a base for the Soviet Black Sea fleet. It was an objective, never quite reached, of the German Caucasus offensive of 1942, and a base for the Soviet counter-offensive of 1943.

Tuareg OR TAWAREK. Arabic nickname for islamised pastoral nomads of Berber stock in central and W. Sahara. Calling themselves Imoshagh, and estimated at 300,000, they include the Asjer between Ghadames and Ghat, the Ahaggar in the S.W. uplands, and the partly negritised Kelowi of Air. See Berbers.

Tuat. Oasis district in the W. Algerian Sahara, part of the Southern Territory of Algeria. The villages of Tuat have a pop. of 17,000.

Tuba. Term applied loosely to the lower brass instruments, but particularly to the bombardon in F (see Saxhorn). It has a wide conical tube about 13 ft. in length, and is fitted with four or five valves. Its tone is soft and thick, its depth of pitch making it a useful member of the orchestra.

Tube (Lat. *tuba*). Literally, a hollow cylinder, generally used for conveying fluids. Tubes serve a great variety of purposes in engineering work, surgery, etc. The term tube or tube rly. is also used for the deep underground rly. system of London. See Twopenny Tube; Underground Railway.

Tube Flower (*Clerodendron siphonanthus*). Shrub of the family Verbenaceae, growing native in the Indian sub-continent. It attains a height of about six ft., and has opposite undivided leaves and terminal clusters of white, funnel-shaped flowers with long projecting stamens and style.

Tuber. Fleishy enlargement of the stem or root of biennial or perennial plants. Tubers are stored with food to enable the plant to survive periods of frost or



Tube Flower. Leaves and cluster of white flowers, showing the projecting stamens

drought when its parts above ground are destroyed. Potato tubers are the swollen ends of underground stems, the eyes containing buds which develop into new shoots. See Artichoke; Potato; Rush Nut.

Tuberaceae. Family of subterranean fungi of the family Ascomycetes. See Hart-truffle; Truffle.

Tuberculin. Substance prepared from cultures of the bacilli of tuberculosis. Introduced by Koch in 1890, it was expected to provide an effective cure for tuberculosis. Its use, however, proved disappointing, and it is now rarely administered to human beings, streptomycin having replaced it. Tuberculin is still a test for the presence of tuberculosis in cattle. See Bacillus.

Tuberculosis (Lat. *tuberculus*, little bump). Infectious disease of world-wide incidence. As a disease of the lung it was known to the physicians of ancient Greece as a wasting disease; hence its other name, phthisis. The cause is a micro-organism called the tubercle bacillus, or the bacillus of Koch, the physician who discovered it. There are three known types of bacilli—human, bovine, and avian. The first two attack the human race, the human type producing infection by inhalation, the bovine by ingestion of the milk of tuberculous cows. Efficient pasteurisation, and proper handling, of milk protect man from bovine tuberculosis. The bovine bacillus can cause widespread disease in animals, especially cows and pigs.

No child is born with tuberculosis; the disease is the result of direct infection. It affects glands, bones, joints, and the genito-urinary system (bladder, testicle, and kidney) when it is often referred to as surgical tuberculosis. When present in the lungs it is called pulmonary tuberculosis. These forms of disease may be in-

tercurrent, or one can result from the other, while both can lead to tuberculous meningitis.

Whatever be its route of entry to the body, the tubercle bacillus can always reach the lungs. Usually this takes place in infancy or early childhood from minimal infection. It produces but little clinical effect, leaving only a small hard nodule, called a Ghon's focus, in the lung substance, and calcified glands at the root of the lung. If, however, the child's resistance is poor, or it gets repeated infections, which do not allow it to develop immunity, it gets blood-borne extension (miliary tuberculosis), or a spread of infection through the air passages (pneumonic or broncho-pneumonic tuberculosis). Such forms are almost invariably fatal; many sufferers have terminal tuberculous meningitis.

From childhood up to adolescence the disease may show the form called epi-tuberculosis in which the infection is resisted by acquired immunity; the condition is therefore an allergic response of the body. The child so affected is usually fretful and feverish. The illness may last many months before resolution. Fortunately most children recover, and the result is similar to that mentioned above, a calcified lung focus and enlarged root glands. Some, however, go on to the adult form of pulmonary tuberculosis.

If adolescent life is reached before primary infection, the disease takes a special form called adolescent primary phthisis. Very enlarged glands are seen on the X-ray film. The condition is often associated with swellings and discoloration on the shin-bones, called erythema nodosum—indeed this may be the only evidence of the recent tuberculous infection. It follows that every young person with erythema nodosum should have an X-ray photograph taken of the chest. With rest, adolescent primary phthisis has, in the vast majority, a good prognosis. Without it the patient may progress to true adult phthisis; the usual form of pulmonary disease above the age of fifteen.

Adult phthisis takes three main forms:

(a) acute, usually rapidly fatal; it has become rare in the U.K.;

(b) fibro-caseous: this means that healing, or fibrosis, accompanies the tendency to extension and breaking down of lung tissue, called caseation; it is the usual form, giving a slowly advancing

process that may be quite extensive before the patient seeks medical advice;

(c) fibroid, in which fibrosis is much more in evidence than active spread; it is common after 45 when it is often of the type called senile phthisis. It is dangerous to the community as it simulates chronic bronchitis, and is therefore the unknown source of infection to the contacts of the sufferers, especially those in very close contact, such as children and grandchildren. French physicians are wise in stating that all elderly chronic bronchitics are potential sources of tuberculous infection until proved to be otherwise.

The onset of pulmonary tuberculosis is slow and insidious, and symptoms are often ignored until the disease is advanced. Cough which lasts more than a month requires full investigation, including an X-ray film. Sputum is a fairly early sign: later come fatigue, indigestion, loss of weight, and night sweats. In many the first evidence of established disease is a perianal abscess. A few fortunate sufferers get a warning of early disease by bringing up blood, or by an attack of pleurisy. Such signs in a young adult should demand rigorous examination, and experience has shown that the patient should be treated as suffering from early pulmonary tuberculosis even if no other sign or symptom appears, for many such individuals, if untreated, develop the disease in unmistakable form within three to four years.

High cost formerly made mass examination of the supposedly healthy population out of the question; but the use of a 35 mm. film to take miniature photographs of the image of the chest thrown on a fluorescent screen by X-rays made it possible for up to a hundred persons an hour to pass before specialised apparatus, the resulting film being projected and enlarged on the magic lantern principle so that the expert eye can see any abnormal shadow which requires further investigation. Some three per 1,000 of the supposedly healthy in the U.K. have active disease unknown to themselves; the age groups of highest incidence are 17-24 and 35-39. Another five to six per 1,000 have disease which is quiescent or apparently healed at the time of the first examination; many of these require continued observation.

TREATMENT OF PULMONARY TUBERCULOSIS. Basic treatment of active pulmonary tuberculosis

is rest. Open air treatment was preached for many years by Boddington before, at the beginning of the 20th cent., sanatorium treatment became the rule, and hygienic conditions in country districts with good food were relied on to arrest the disease. After-histories of patients so treated, however, showed that most of them died within five years of returning home. Failure was due to the advanced stage the disease had reached before being diagnosed; lack of active forms of treatment for the diseased lung to supplement rest and graduated exercise; and return to unsuitable conditions of life and work.

The commonest form of active treatment is artificial pneumothorax. Air introduced into the pleural cavity (*see* Lung) removes the negative, sub-atmospheric pressure in this space, so that the elastic lung is allowed to relax. The diseased area is no longer under tension; its movement is much restricted. This simple operation leads to cure in many sufferers. Where disease has caused adhesion between the lung and the chest wall, however, this treatment may fail, and to relieve tension and allow relaxation of the lung it may be necessary to make the chest wall fall in. This is done by various modifications of an operation called thoracoplasty, which removes parts of the ribs. In expert hands it has brought arrest of disease to large numbers.

Chemotherapy has been attempted for centuries in the treatment of tuberculosis. The ancient Greeks tried gold and antimony. Quinine was used in the 17th cent.; in the 19th iodine, iron, creosote, chlorine, and various gases including CO₂ were used. None of these had success. It has, however, been discovered that several agents will kill the tubercle bacillus in a test tube and sometimes in an animal, but will not kill it in a human being without killing the patient.

Gold sodium thiosulphate, popular before 1939, is considered to be at best only an aid to healing in patients who have already fibroid disease. Promine has been tried with good results in animals, and some allied substance may prove effective in man.

Streptomycin (*q.v.*) has proved effective in a proportion of cases of acute type. *See* B.C.G., in N.V.; also Papworth Village Settlement. *Consult* Manual of Tuberculosis, E. Ashworth Underwood, M.D., D.P.H., 1945.

R. E. Trail, M.D., F.R.C.P.

Tuberose (*Polianthes tuberosa*). Bulbous herb of the family Amaryllidaceae. It is a native of Mexico.



Tuberose. Lance-like leaves and spray of fragrant cream flowers

It has narrow lance-shaped leaves and a tall flower stem ending in a spray of many creamy-white, funnel-shaped, highly fragrant flowers. *Pron.* tu-ber-ose.

Tübingen. Town of Württemberg-Hohenzollern, Germany, on the left bank of the Neckar, 22 m. S. of Stuttgart. The old quarter, with its narrow streets and gabled houses, is built round the 16th century castle, which now houses the observatory and university library. The church of S. George (1470-1529), with the tombs of the dukes of Württemberg, the town hall (1435-46), and the R.C. church are other notable buildings.

The university, founded 1477, is famous for its influence on Theological Controversy, hence the term Tübingen school applied to the followers of F. C. Baur, who inaugurated here a specially critical type of Biblical scholarship. J. A. Möhler founded a similar R.C.



Tübingen, Germany. The Market Place, showing the town hall on the right

school of thought. Here the poet Uhland was born.

Tübingen has many industries, including engineering, paper, textiles, and the manufacture of surgical instruments. Fruit is grown on the hills, and wine is made in the neighbourhood. The town was known in 1078, and came within the jurisdiction of Württemberg in 1342. It sustained some damage in the Second Great War, when it was captured by the French, April 20, 1945. After the surrender of Germany Tübingen was capital of the French zone of occupation. Pop. (1939) 28,686, increased by 1950 to over 36,000 by an influx of refugees.

Tubocurarine. Alkaloid derived from curara, the S. American arrow poison. Although curara was first mentioned in English literature by Hakluyt in his account of Raleigh's voyage up the Amazon in 1595, not until the 20th century was curara therapy placed on a sound basis. *D*-tubocurarine chloride, the alkaloid which produces the classical action was isolated in 1935. Recent investigations into the botanical source of the drug prove that *d*-tubocurarine chloride occurs in the S. American liana *Chondrodendron tomentosum*. The principal use of tubocurarine is as an adjunct to anaesthesia to relax the muscles. See Curara.

Tabuai OR AUSTRAL ISLANDS. Lonely group of coral islets in the South Seas. It lies S. of the Society Islands, and is rarely visited even by the French, to whom the group has belonged since 1881. The islets are Ravaivai, Tubuai, Rurutu, Rimatara, and an outlier Rapa. The pop. is 3,921. Chief exports are copra, sponges, arrowroot.

Tucker, CHARLOTTE MARIA (1821-93). British author. Born May 8, 1821, she wrote a large



Charlotte Tucker,
British author

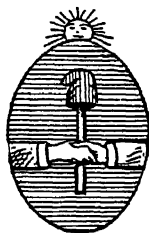
number of books for children under the pseudonym A. L. O. E., *i.e.* A Lady of England. She was also much interested in missionary effort, and in 1878 went to India, where she was active in visiting the zenanas and promoting native education. She died at Amritsar, Dec. 2, 1893.

Tucket (Ital. *toccata*, touched). Old musical term for a flourish of trumpets. It is frequently met with in the Elizabethan dramatists. Its exact form is unknown,

but it was similar to the sennet, though less elaborate.

Tucson. City of the U.S.A., capital of Pima co., Arizona. It stands on the Santa Cruz river, 130 m. S.E. of Phoenix, and is served by the Southern Pacific rly. Here are a magnetic observatory, the university of Arizona, and S. Joseph's academy. Tucson was settled in 1700, when Spanish friars established a mission to the Pima Indians there. It was the state capital, 1867-77, shortly becoming famous as a resort for invalids needing a dry, sunny climate. Pop. 36,818, but rising by some 10,000 each winter.

Tucumán. Prov. and city of Argentina. The prov. is the most densely peopled in the republic.



Tucumán arms

Among the W. mountainous offshoots of the Andes there is lumbering in the forested valleys and mining for gold, silver, and copper. The rolling plains of the E., which abut on the Gran Chaco, yield maize, tobacco, wheat, grapes, and other fruit, especially where irrigation is possible.

The capital, also known as San Miguel de Tucumán (pop. 157,926) is situated on a plateau near the Tala or Salí, and has rly. connexion with Buenos Aires. A university was opened in 1914 and the cathedral is modern. There are sugar factories, breweries, distilleries. Here in 1816 the first congress of the republic was held, and the declaration of independence from Spain was signed. The city was founded in 1565. The prov. was originally part of the lands of the Incas. Its area is 8,817 sq. m. Pop. 604,526.

Tudela (anc. Tutela). Town of Spain, in the prov. of Navarre. It stands on the Ebro, 52 m. by rly. N.W. of Saragossa. Lumbering and the production of silk goods, oil, and wine are the principal industries. After being in Moorish hands for 300 yrs. the town was recaptured by Alphonso I of Aragon in 1114. Pop. 12,000.

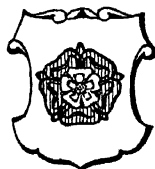
Tudor. Type of British civil aircraft. Built by A. V. Roe and co., it was originally designed as a commercial version of the Lancaster bomber. The prototype first flew in 1945, and the production type went into service next year. Powered by four Rolls-Royce Merlin engines developing a

total of 7,080 h.p., the Tudor I had a maximum speed of 346 m.p.h. and a range of 3,700 m. It carried a crew of five and had accommodation for 24 passengers. There were eight versions, Marks 1 to 8; these differed in accommodation, and the last was fitted experimentally with gas turbines.

Tudor. Name of five sovereigns of England (1485-1603). The earliest members of the family lived in Anglesey. About 1429 Owen Tudor appears as a member of the court circle and later was married to Queen Catherine, widow of Henry V and mother of Henry VI. After the queen's death in 1437, Owen went back to Wales. He fought for the Lancastrians in the Wars of the Roses and was beheaded at Hereford in 1461. Tudor and the queen had two sons, Edmund and Jasper. Edmund was made earl of Richmond and married Margaret Beaufort, a descendant of Edward III through John of Gaunt. Their only child became Henry VII. Jasper died without sons in 1495, having been made earl of Pembroke and duke of Bedford. The Tudors retained the throne until the death of Elizabeth in 1603. From Henry VII, through his daughter, Margaret, wife of James IV of Scotland, James I was descended (see England; Royal Family).

The name Tudor rose is given to the union of the red and white roses of Lancaster and York, which formed the royal badge of England in 1486; it is often found in Tudor architecture. Consult Tudor Geography, 1485-1583, E. G. R. Taylor, 1930; Tudor Constitutional Documents, 1485-1603, ed. J. R. Tanner, 1930.

Tudor Style. Late stage of Gothic architecture which prevailed in England under the Tudors, 1485-1603. In its later phase it is sometimes called Elizabethan, as classic detail, under Renaissance influence, became more assertive in Elizabeth's reign. Tudor architecture was throughout transitional in character (see Transition). In church building it manifested itself in the late Perpendicular (*q.v.*) style, as in Henry VII's chapel, Westminster. The character of the style is essentially English and individual, and we owe to it the noblest domestic dwellings in the country, such as St. James's



Tudor rose as depicted in heraldry

Palace; Hampton Court; Sutton Place, Surrey; Haddon Hall; Hever Castle, Kent; and Wolsey's college buildings at Oxford.

Tuesday. Third day of the week, so called from an old Saxon deity, Tiw. The Romans called the day Dies Martis (day of Mars), cf. French *mardi*.

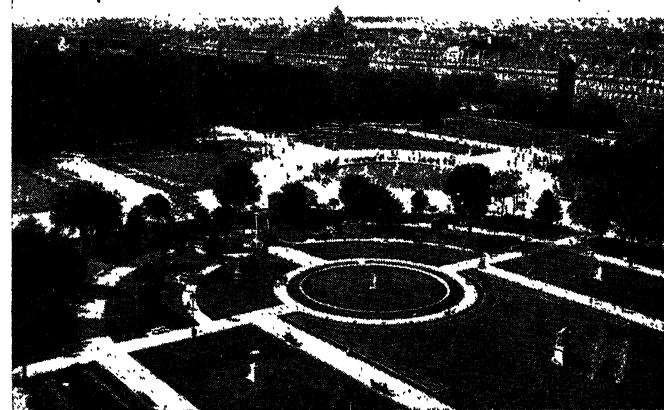
Tuff. Rock formed of consolidated volcanic ashes. If the large fragments exceed 32 mm. in diam., it is referred to as agglomerate or volcanic breccia. The term tuff is usually confined to finer grades of material, which is spoken of as coarse, medium, or fine tuff. Very fine material, less than 0.05 mm., forms dust tuff. See Rock. Consult Geology for Engineers, F. G. H. Blythe, 1943.

Tug. Self-propelled vessel used for towing. The steam tug was introduced in 1802, when a boat fitted with engines by Symington towed barges on the Forth and Clyde canal. There are four principal types of tugs: harbour, river, canal, and ocean-going. The first displace some 150 tons and have engines developing about 450 h.p.; working in groups of two to six, they manoeuvre ocean-going ships into and out of dock. River tugs are engaged mainly in towing lighters, as on the Thames; canal tugs have shallow draught and less powerful engines. Ocean-going tugs are engaged principally in salvage work delivering such structures as floating docks; a typical vessel displaces 650 tons and has engines developing 6,000 h.p.

Tugela. River of Natal, S. Africa. It rises in the Mont-aux-Sources, where are the Tugela Falls, about 2,050 ft. high, and runs E. to the sea between Umvoti and Port Durnford. The river forms the boundary between Zululand and Natal proper.

Tugela, BATTLES OF THE. Series of actions fought between Dec., 1899, and Feb., 1900, in order to bring about the relief of Ladysmith. After the investment of the latter, the Boers, having failed in an attempt to invade S. Natal, took up under Botha a position along the Tugela river to the S. of Ladysmith, with the Colenso kopjes and other heights in their rear. Buller, advancing from the S., attacked on Dec. 15, and was severely defeated at Colenso (*q.v.*).

In the second half of Jan., Buller again tried to break down the barrier. Spion Kop (*q.v.*) was captured and lost again. On Feb. 5 Buller made a third attempt to reach Ladysmith by way of Vaal Krantz, about 3 m. N.E. of Pot-



Tuileries, Paris. Air view of the palace gardens, now a public park

gieter's Drift. Vaal Krantz was captured by Lyttelton, but North Hill to the N. of it was deemed unassailable, and Vaal Krantz itself was found to be exposed to heavy artillery fire. Buller accordingly withdrew once more across the river.

On Feb. 14 a fourth attempt was made, in the course of which Monte Christo and Hlangwane Hill on the S. or right bank of the Tugela were seized. But further progress was found to be impracticable, and it was not until Feb. 26 that Buller, after crossing the Tugela for the seventh time, was able to make his fifth and final advance on Ladysmith, which was entered by Dundonald's cavalry two days later. See South African War.

Tugendbund (Ger., league of virtue). Prussian patriotic association. It was formed at Königsberg (now Kaliningrad) in 1808 to promote the moral and educational regeneration of Prussia after its humiliation by Napoleon, and was dissolved by Frederick William III next year.

Tuileries, PALAIS DES. Former royal palace in Paris, so named from the tile-yards (*tuileries*) once on the site. It stood between the Louvre and the Place de la Concorde. Designed by Philibert de l'Orme for Catherine de' Medici, and begun in 1564 on the site of a former structure just outside the walls of Paris, the Tuileries long served as a pleasure house for the kings of France. Jean Bullant succeeded de l'Orme as architect. When Louis XVI was brought back to Paris by the revolutionaries in 1791 after his attempt at escape, the palace became his regular residence; it was subsequently used by the Bonapartes and Bour-

bons until 1871, when it was burned by the Commune. Its garden, however, remains as a public park, and retains some remarkable statuary. See French Revolution; Paris.

Tuke, HENRY SCOTT (1858-1929). British painter. Born at York, June 12, 1858, he became well-known as a painter in both oils and water colours, mostly of anecdotal subjects, especially for his variations on the theme of boys bathing in the sea. He exhibited regularly at Burlington House, and became R.A. in 1914. Two of his works are in the Tate Gallery: August Blue (boys bathing) and All Hands to the Pump! He died in March, 1929. Consult Life, M. T. Sainsbury, 1933.

Tuke, WILLIAM (1732-1822). British philanthropist, born at York, March 24, 1732, of Quaker parents. He became a tea and coffee merchant, and in 1792 drew the attention of the Society of Friends to the need of reform in the treatment of the insane, with the result that the Retreat was opened at York four years later. He introduced many improvements, including the teaching of industries and the abolition of excessive restraint and of antiquated remedial measures. Tuke died Dec. 6, 1822.

Several descendants of William Tuke, including his grandson, Samuel Tuke (1784-1857), and Samuel's son, Daniel Hack Tuke (1827-95), rendered great service in the study and amelioration of



William Tuke, British philanthropist From a medallion

insanity. Daniel's brother James (1819-96) advocated economic reforms in Ireland, and did much to relieve the sufferers from famine in that country. *Consult* Chapters in the History of the Insane, D. Hack Tuke, 1882.

Tula. Town of Russia, capital of the region of the same name. A junction on the Moscow-Kursk and Syzran-Vyazma rly., 121 m. S. of Moscow, on the Upa, it contains a government firearms factory established by Peter the Great in 1712, and is famous for its so-called tula metallic wares (niello). There are large tanneries, soap and leather factories, and a small coalfield in the neighbourhood. Pop. 272,000.



Tulip. Brilliantly coloured cup-shaped flowers of the bulbous plant

Although almost encircled by the Germans in their advance against Moscow in Oct.-Nov., 1941, Tula was never captured by them. It remained the centre of very bitter fighting until Russian counter attacks during Dec. drove the Germans from their most advanced positions in this area.

Tulagi. Island in the Pacific Ocean. One of the British Solomon Islands protectorate group, it was until 1945 the seat of govt. It lies 40 m. W. of Malaita, and has an excellent anchorage. In the Second Great War, the Japanese occupied Tulagi early in 1942; there was little resistance as the island was unfortified. On Aug. 7 formations of the U.S. 1st marine div. landed in face of strong opposition; the Japanese garrison, although only some 500 strong, fought almost literally to the last man, and were not overcome until Aug. 10. This was the first victory of the first Allied offensive in the Pacific; but the diversion of U.S. troops it entailed from the operations simultaneously started on Guadalcanal (q.v.) weakened initial Allied effort there, and helped to prolong the battle for that island.

Tulcan. Town of Ecuador, capital of the province of Carchi. It lies 100 m. N.E. of Quito, to which there is a modern highway. Many cattle are reared, and wool, garments, and carpets are manufactured. The elevation is nearly 10,000 ft. Pop. est. 10,000.

Tulcea, TULCŢA, OR TOULCŢA. Port of Rumania. It is situated near the head of the delta of the Danube, but above the separation of the middle and S. arms of the great river, in the Dobruja. It lies 30 m. almost due E. of Braila, and before the First Great War was a thriving port. Here the Russians defeated the Turks in 1791.

Tulip (*Tulipa*). Genus of brilliantly flowering bulbous plants of the family Liliaceae. They are natives of Europe and N. and W. Asia, one species being indigenous to Great Britain. Garden tulips were introduced into England through Holland in the 16th century. They are of various heights, 9 ins. to over 2 ft., and the flowers are of all shades and colours and combinations thereof, except blue, from white to very dark purple. Tulips should be planted during Oct. or Nov. in a light and dry sandy soil. They will not thrive in heavy soils, particularly those with a wet clay subsoil.

The parent of garden tulips is *T. gesneriana*, a rich deep crimson flower with a cup almost as large as a clenched fist, and from it have sprung, by hybridisation, hundreds of nursery-raised kinds. After the foliage has died down, tulip bulbs may be lifted and stored in a dry place, until the time for planting again arrives. They are propagated by seeds and bulblets, and may be forced in the greenhouse in pots in a temperature of 50° to 60° F., for the purpose of winter table decoration. *See* Bulb.

Tulipomania. Name given to the financial speculation in tulip bulbs in the 17th century. The first garden tulip bulb imported from Constantinople in 1559 was planted in a garden in Augsburg. Within ten years the flower became popular. By 1634 competition to possess unusual varieties was so great in the Netherlands that industry and commerce were neglected and all classes were speculating in the bulbs, which changed hands at prices up to £4,000. Soon tulip markets and exchanges were opened at Amsterdam, Leyden, Rotterdam, Haarlem, and other towns, where jobbers dealt in them; and the states-general drew up a code of laws for the guidance

of dealers. For a time the price of tulip bulbs governed that of all other commodities. In 1639 the mania suddenly ceased; thousands of persons were ruined; and the states-general was obliged to declare all existing tulip contracts void. Tulipomania provides the theme of Dumas's novel, *The Black Tulip*.

Tulip Tree (*Liriodendron*). Beautiful flowering, summer-leaving tree of the family Magnoliaceae. It is a native of North America and was introduced into Great Britain in 1668. It frequently attains a height of 80 to 100 ft., and, when matured, bears in summer large green, lemon, and orange-coloured flowers, shaped like the



Tulip Tree. Leaves and large showy flowers of the North American tree

cups of a tulip. It should be planted in autumn or spring in a sandy loam, either in a sunny position in the shrubbery, or a sheltered position upon a lawn. It is propagated by seeds or by layers in autumn.

Tull, JETHRO (1674-1741). British agriculturist. Born at Baisdon, Berkshire, he was educated at St. John's College, Oxford, and became a barrister, but passed his life mainly in farming and in travel. He farmed some of his own land in Oxfordshire and Berkshire from 1699 to 1711, and after spending three years in travelling abroad returned to Prosperous Farm, near Hungerford, where he remained until his death, Feb. 21, 1741. Tull invented a drill for sowing seed. *See* Agriculture (with portrait, p. 175).

Tullamore. Market town and urban dist. of Offaly, Eire, also the county town. It is 58 m. from Dublin, being served by the Eire state rlys. It is the principal town on the Grand Canal, all boats from Dublin to Limerick passing through here; brewing, distilling, and wool-spinning are carried on. Pop. 5,894.

Tulle. Thin silk bobbinet used for veils, hat and dress trimmings, etc. In France the term is used for

bobbinet generally. The word comes from Tulle, France, where the fabric was originally made.

Tulle. City of France. The capital of the dept. of Corrèze, it stands on the river of that name, 45 m. from Limoges. The chief building is the cathedral of Notre Dame, built in the 12th century. Parts of it were burned down in 1783, but a fine old tower still stands. There are remains of an extensive Benedictine abbey and some old houses. Modern buildings include the prefecture. The chief industry is the manufacture of firearms, there being a government factory in the suburb of Souilhac. Pop. 18,202.

Tullianum. Subterranean prison of ancient Rome, on the Capitoline Hill. Here the captives of victorious generals were put to death after the triumph (*q.v.*), and criminals were executed. Its name of Mamertine Prison dates only from the Middle Ages. See Rome.

Tulliver, TOM AND MAGGIE. Brother and sister who are the central figures in George Eliot's novel, *The Mill on the Floss* (*q.v.*).

Tulloch, JOHN (1823-86). Scottish theologian. Born June 1, 1823, at Bridge of Earn, Perthshire, and educated at the universities of St. Andrews and Edinburgh, he served for a few years as a parish minister. In 1854 he was appointed principal of S. Mary's College, St. Andrews, and also professor of theology. One of the most prominent ministers of the Church of Scotland, he became moderator of the General Assembly in 1878. He wrote a number of works on theological and philosophical subjects and a book for young men entitled *Beginning Life*, 1862. He died Feb. 13, 1886. His son, W. W. Tulloch (1846-1920), was also a distinguished minister of the Church of Scotland and a noted writer. He enjoyed the friendship of Queen Victoria, who revised the *Lives* he wrote of her and the prince consort.

Tullus Hostilius. Third of the seven legendary kings of ancient Rome, reputed to have reigned from 670 to 640 B.C. During his conquest and destruction of Alba the famous incident of the Horatii (*q.v.*) and Curiatii occurred. Tullus was also credited with the conquest of the Sabines. He was killed by a thunderbolt for seeking from Jupiter more than mortal might rightfully know.

Tully. Obsolete Anglicised name for Marcus Tullius Cicero (*q.v.*).

Tulsa. City of Oklahoma, U.S.A., the co. seat of Tulsa co. It stands on the Arkansas river, 121 m. N.E. of Oklahoma City,



Tummel, Perthshire. Falls of the river near the Pass of Killiecrankie

and is served by the Atchison, Topeka, and Santa Fé and other rlys. Bricks, glass, cotton-seed oil are manufactured, and coal-mining and oil-refining are carried on. Tulsa was laid out in 1887 and became a city in 1902. Race riots laid waste the negro quarter in 1921; later this was rebuilt by popular subscription among the whites. Pop. 142,157.

Tulse Hill. Dist. of S.E. London. In the bor. of Lambeth (*q.v.*), it lies E. of Brixton Hill and Streatham Hill, and includes Brockwell Park (*q.v.*).

Tulwar. Type of Oriental sword, known also as *Talwar* (*q.v.*).

Tumbes. Prov. of N. Peru. It lies between the Cerros de Amotane and the S. shore of the Gulf of Guayaquil, and adjoins Ecuador. Area, 1,590 sq. m. Pop. 25,709. The capital, of the same name, stands on the Tumbes river near the Gulf of Guayaquil, 70 m. N.W. of Loja; it is on the Pan-American Highway.

Tumilat. Wadi, 30 m. long, connecting Ismailia on the Suez Canal with the cultivated Delta at Abu Hammaed, Lower Egypt. Its fertility is due to its fresh-water canal, representing the ancient ship-canal of Necho II and Darius I. It lay on the immemorial Syrian trade-route, and was the initial stage in the Hebrew exodus, Pithom being near its E. end (Exod. 1). In 1882 it was the scene of British operations against Arabi.

Tummel. Name of a river and loch in Perthshire, Scotland. The river empties from the E. end of Loch Rannoch, flows E. 9½ m., and then broadens into the loch, ½ m. wide and 3 m. long. The river thence flows 8 m. E.

to the picturesque falls of Tummel, where it turns to the S.E. to join the Tay, 7 m. N.N.W. of Dunkeld, receiving the Garry about 1 m. below the falls. In 1945 a scheme was made to divert and impound the waters of the rivers Tummel and Garry, Errochty Water, Loch Tummel,

and Bruar Water to produce hydro-electric power; the first turbo-alternators began to run at Clunie in 1950.

Tumour. A swelling or morbid enlargement due to a mass of tissue which grows independently of the surrounding tissue. Tumours are described as "innocent" or "malignant." The former grow only in the spot on which they first appear, pushing aside the neighbouring tissues; they do not spread to other parts of the body. From malignant tumours small pieces become detached and are carried in the blood or lymph stream to various parts of the body, where they set up secondary growths. The cause of tumours is unknown. Malignant tumours eventually cause death by destroying essential tissues and by producing poisonous substances. One theory is that they are due to minute masses of foetal cells which become included in the tissues and later take on vigorous growth.

Tumuc Humac Mts. Range of low mts. in the N.E. of S. America. It divides Brazil from French and Dutch Guiana and forms an extension of the Serra Acaray, both ranges forming part of the Guiana Highlands. It culminates in Timotokem at 2,625 ft. Gold is found in the range.

Tumulus (Lat., hillock). Burial or memorial mound, especially one distinguished by size, form, or association. Such were Silbury Hill (*q.v.*); the grave, 100 ft. across, of Patroclus at Troy; the



Tumulus. Silbury Hill, a large tumulus in the Kennet Valley, Wiltshire, probably dating from Neolithic times

mound, 30 ft. high, raised to Athenian warriors at Marathon, 490 B.C.; the Lydian tomb near Sardis, 200 ft. high, of Alyattes II, 560 B.C.; the Lion Mound at Waterloo. See Barrow; Burial Customs; Dagoba; Mastaba; Mound; Stone Monuments; Stupa; Teocalli.

Tun. Measure of liquid capacity, containing 252 wine gallons. As the name of a large barrel, holding approx. 2,000 pounds of water, the word is probably an older form of ton. A tun of sweet oil is 236 galls. See Heidelberg; Ton.

Tunbridge Wells. Borough and watering place of Kent, England. Picturesquely situated on the border of Sussex, in which co. part of it was included until 1894, it is 5 m. S. of Tonbridge, and 34½ m. by rly. S.E. of London. The common covers 170 acres. At the S.W. end of the



Tunbridge Wells arms

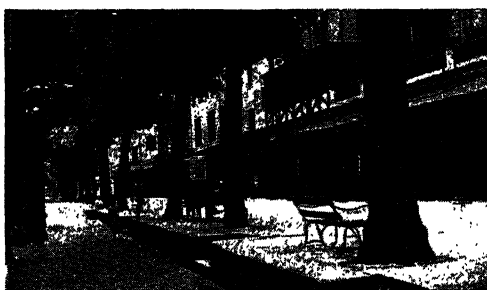
Parade, long famous as The Pantiles, first laid out in 1638, are the mild chalybeate springs which, discovered in 1606 by Dudley, 3rd Baron North, and enclosed by his friend the earl of Abergavenny, made the place a celebrated resort of fashion in the 18th century. The church of King Charles the Martyr was built in 1685, and enlarged later; there are a public hall and theatre. There are several recreation grounds and golf courses, as well as facilities for tennis and bowls. Near the town are Penshurst, Rusthall Common with the Toad Rock, Eridge, Crowborough, and other places of interest. Rock-climbing is a notable recreation of the neighbourhood. An annual county cricket festival is held here. Pop. 35,866. Consult Society at Tunbridge Wells in the 18th Century— and After, L. Melville, 1912; Royal Tunbridge Wells, Past and Present, J. C. M. Given, 1946.

Tunbridge Wells Sand. Group of sandstones and unconsolidated sands occurring at the top of the Hastings Beds of the Sussex Weald. They are named after Tunbridge Wells, where they are exposed. See Cretaceous; Wealden Deposits.

Tundra. Extensive barren lowlands bordering the Arctic coastlands of N. America, Europe, and Asia. The mean temp. remains below freezing point except for two to three months, when it rises nearly to 50° F. Annual precipitation does not reach 10 ins. Therefore the tundra is a cold desert. The soil never thaws below a depth of about 2 ft., so that the only plants are stunted berry-bearing shrubs, mosses, and lichens. The chief animals are reindeer, caribou, and musk oxen. In winter the tundra is a dreary wilderness of ice and snow. The rivers have laid bare cliffs of ice and frozen soil, in which are embedded bones of mammoths and other extinct animals. The tundra is sparsely inhabited by Eskimos (N. America); Finns and Lapps (Europe); and Ostyaks, Samoyedes, and Yakuts (Siberia).

Tung or KUKUI OIL. Oil expressed from the kernels of the fruit of several species of *Aleurites*. The oil, one of the best drying oils, is used in quick-drying varnishes and paints. See Candle-nut.

Tungabhadra. River of India, in the Deccan. The Tunga and Bhadra rise close to each other in the W. Ghats, and unite at Kudali in Mysore to form the Tungabhadra, which flows N., N.E., and E. to join the Kistna below Kurnool. Principal affluents are the Varada on the left and the Hagari on the right. Coracles are used for the con-



Tunbridge Wells, Kent. The Pantiles, the once fashionable promenade where visitors to the Wells met when taking the waters

veyance of passengers. The city of Vijayanagar is near the river.

Tung-kwan. Town of China, on the right bank of the Yellow river, at the angle where the three provinces of Shensi, Honan, and Shansi meet. Two important arteries of traffic cross here, leading E. and W., and S.W. and N.E., respectively. There is a pass of the same name in the neighbourhood. Pop. est. 80,000.

Tungsten. Chemical element. Its symbol is W (wolfram); at. no. 74; at. weight, 183.92; specific

gravity, 19.3; electrical conductivity, 29 (silver being 100); melting point 3,370° C.; crystal structure, (a) alpha-tungsten, body-centred cubic, with lattice constant $a=31.58$, and (b) beta-tungsten, a unique cubic structure with a unit cell containing eight atoms, its side being $a=5.038$.

A new acid, tungstic acid, was first isolated by Scheele in 1781 from a mineral (calcium tungstate) now called scheelite; the following year Bergman obtained the same acid from wolframite, later preparing the metal. The name tungsten comes from the Swedish for heavy stone.

The two chief natural sources of tungsten are still wolfram or wolframite ($(\text{FeMn})\text{WO}_4$), and scheelite, CaWO_4 , but in certain parts of the U.S.A. the minerals ferberite, FeWO_4 ; and hubnerite, MnWO_4 , are of economic importance. The largest producer is China, closely followed by Burma, and between them they produce about five-sevenths of the world's annual production of some 35,000 tons of tungsten concentrates, with an average content of over 60 p.c. WO_3 . Smaller producers are the U.S.A., Portugal, and Bolivia. Scheelite is used largely to make ferro-tungsten, for alloy steels; tungsten metal is prepared chiefly from wolframite. The first stage in production of the pure metal is the preparation of tungstic oxide.

Wolfram concentrate is either fused with sodium carbonate or treated with a strong caustic soda solution. Calcium chloride is added to precipitate calcium tungstate and this is treated with hot 50 p.c. hydrochloric acid to recover the tungstic acid. Scheelite concentrates are usually treated with dilute acid, leaving the tungstic acid as a sludge. Tungstic oxide is reduced to tungsten powder by heating in an atmosphere of hydrogen, or, if it is to be used in the production of alloys when high purity is not so essential, by heating with carbon.

It cannot be melted or cast, but is treated by the methods of powder metallurgy. The powder is compressed and sintered at 1,300° C. in hydrogen and then heated to 3,200° C. by passing an electric current through it. It may then be swaged at 1,500° C. until sufficiently malleable to be drawn through tungsten carbide dies and finally through diamond dies to give very fine wire. This process was developed by Coolidge in 1909. The metal as thus produced has a purity of more than 99.75 p.c., and it is a ductile steel-grey ma-

terial with great strength and hardness. It has a tensile strength of 200 tons per sq. in. and a diamond hardness of between 400 and 500. The first use of tungsten was as wire for electric light filaments and later for radio valves, X-ray tubes, and other electronic devices. But these uses now account for only a small proportion of the world's production, by far the larger part being consumed by the steel industry. Tungsten is added to steel to increase its hardness, and its chief use is for high-speed tool steels. A typical tool steel contains 18 p.c. tungsten, 4 p.c. chromium, and 1 p.c. vanadium, and similar steels are used for making valves and valve-seats in internal combustion engines and as dies for swaging and wire-drawing. Tungsten carbide tool tips, dies, electrical contacts, etc., are extremely hard and wear resisting, being second only to diamond in this respect. Tungsten is also used in certain non-ferrous alloys to increase their hardness, density, and resistance to high temps. Certain tungstates are useful for making blue and green pigments for ceramics and paints; and certain tungsten salts render various types of cellulose non-inflammable. Tungsten has three oxides, WO_3 , W_2O_5 , and WO_2 , and it forms numerous chemical compounds. In 1949 its name was officially changed to wolfram.

Tunguragua. Active volcano of Ecuador. It rises to 16,700 ft. among the Andes in the S. of the prov. to which it gives its name.

Tunguragua. Prov. of Ecuador. It is crossed by the E. Cordillera of the Andes and is adjacent to the provs. of León, Bolívar, Chimborazo, and Oriente. It is drained by the Pastaza and other affluents of the Marañón. The cap., Ambato, was virtually destroyed by earthquake in 1949. Area 1,685 sq. m. Pop. 223,100.

Tungus (Chinese, eastern barbarians). People of Altaian stock in E. Siberia. Numbering perhaps 70,000, their many tribes, between the Yenisei and the Pacific, include the Lamut, Orochons, and Golds. Once horse nomads along the Amur, they moved N. before the 12th century, adopting forest hunting, coast fishing, reindeer herding, riding, and husbandry in the Amur valleys. The Manchu are an offshoot of this people. The aboriginal shamanism is venerated by either Lamaism or Orthodox Christianity.

Tunguska. Name of three rivers of Siberia, tributaries of the

Yenisei. They are called the Upper Tunguska (Angara), the Middle or Stony (Podkamenai), and the Lower (Nijnaia). The Angara (q.v.) issues from Lake Baikal. All flow generally W. across the Krasnoyarsk region.



Tun - Huang.

Town and oasis in outer Kansu, China, close to Sinkiang. Its former importance arose from its propinquity to the high-roads from China to the Roman Orient, and from Tibet to Mongolia. In 1907 Stein explored its hundreds of cave shrines, and from a cella walled up in 1036, at the Caves of the Thousand Buddhas, procured for the British Museum 500 paintings on silk, linen, and paper, mostly of the Tang period, 620-907; 150 textile pieces, and 6,500 MSS. and printed books. See Turkistan; consult The Thousand Buddhas, M. A. Stein, 1922; Six Centuries at Tunhuang, L. Giles, 1944.

Tunic (Lat. *tunica*). Woollen undergarment in the nature of a shirt worn by the Romans, both men and women. With short sleeves a man's tunic reached to the knees and over it the toga was worn. Women's tunics reached to the feet, and were worn under-

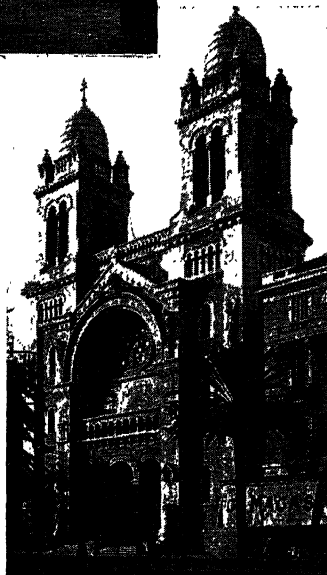
neath the palla. Today the word is used for a short, loose garment, and for a military uniform jacket. See Costume; Toga.

Tunicata. Group of marine animals, holding a position between the vertebrates and the invertebrates. They are familiar on all rocky coasts as Sea Squirts or Dead Men's Fingers (q.v.), and many of them assume the form of a tubular bag of leathery tissue, attached by the base to a rock or other object. They were formerly regarded as molluscs, but are now known to be related to the vertebrates. In the larval stage they are free-swimming tadpole-like animals, with a well-developed notochord in the tail, and a central nerve tube ending in an expansion which is a forerunner of the brain in the vertebrates. When the animal becomes adult it attaches itself to some object; the tail, notochord, and "brain" disappear, and the animal assumes a tubular form.

Tuning. In music, the adjustment of sound-producing media, both to a standard pitch and to their relative positions in regard to key. Wind instruments are made in certain keys, and completed with scrupulous attention to the proportion of bore to length, and to the proper position of valves, slides, or holes. In the harp and the string instruments, fundamental tuning is effected by the player.

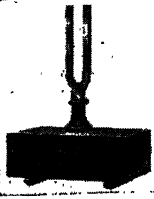
-Piano and violin strings

and the like are tuned by regulating their tension. Organ pipes are tuned in different ways according to their nature and material; metal flue pipes by having the tops widened (sharper), or narrowed (flatter) by a tuning cone; wooden, open pipes by adjusting a tuning flap at the back; stopped pipes by altering the position of the stopper; reeds by tapping the wire holding down the ends of the tongue, to alter the vibrating length.



Tunis. R.C. cathedral, built 1893-97. Top, minaret of the Great Mosque ez-Zeitouna. See facing page

Tuning-fork. Steel rod bent in the middle, and having at the fold a handle or foot. Owing to its permanence of tone and its almost complete lack of upper partials, it is much used for indicating definite pitch. By means of an electro-magnet and a light "make-and-break" contact, tuning-forks can



Tuning-fork used for indicating musical pitch
By courtesy of
Boosey & Hawkes

be maintained continuously in vibration by an electrical supply.

Tunis. City of N. Africa, capital of Tunisia. It is situated on a small lagoon near the Gulf of Tunis, in the N. of the country, and is connected with Bizerta and the other principal cities of Tunisia and Algeria by rly. Ocean-going vessels can reach Tunis by a 7-m. channel dredged in the lagoon to Goletta (q.v.), and opened in 1893. The ancient Arab city is of great interest, and contains many elegant mosques, notably that of Sidi-Mahrex. Tunis was occupied by the French, May 12, 1881. During the Second Great War it was occupied by the Germans in Nov., 1942, and taken without serious fighting by British and Americans May 7, 1943. About three miles distant are the ruins of Carthage (q.v.). Pop. (1936) 219,578, including 93,356 Muslims, 27,345 Jews, 42,878 French, 49,978 Italians, 4,855 Maltese.



Tunis arms

Tunisia (Fr. La Tunisie). French protectorate in N. Africa. It lies between Algeria and Tripolitania, and has a coastline c. 550 m. long. It is c. 48,300 sq. m. in area, and occupies a commanding strategic position upon the N. African littoral. The inhabitants, 2,608,313 in 1936, most of whom are Beduin Arabs and Kabyles, included a large Italian element, 94,000, some 60,000 Jews, about 7,000 Maltese, and a French population of 108,000, exclusive of the military.

Much of the country is mountainous; in the S. lie desert steppes, in the E. low and sterile desert; but some parts are extremely fertile. The interior is traversed by three mountain chains. Between these ridges are numerous elevated val-

leys extensively cultivated in the N. and producing cereals, oranges, dates, figs, vines, almonds, and olives. The most important river, the Medjerda, flows from Algeria, and falls into the Gulf of Tunis near Porto Farina. There are numerous lakes; those in the S., however, generally dry up during the hot season. The climate is warm and agreeable in the coastal and elevated regions, but hot in the more sterile dists. The chief industry is agriculture, but there are deposits of iron, lead, zinc, lignite (production 68,560 tons in 1946), and phosphates (695,000 tons in 1946).

Rlys. connect the chief centres of pop. and are linked with the Algerian system. The principal cities are Tunis (q.v.), the capital; Sfax (93,333), a port on the Gulf of Gabes; Susa (28,465), a port on the Gulf of Hammamet; Bizerta (28,468), a strongly fortified harbour at the extreme N. point of Africa; Gabes (18,611); and Kairwan (22,991), the holy city of the Muslims.

In the earliest times a possession of Egypt, Tunisia was later occupied by the Phoenicians and Canaanitish wanderers. In the 7th cent. B.C., exiles from Tyre, and Phoenicians, under Dido founded the celebrated city of Carthage (q.v.). Subsequently passing under the domination of the Romans, the Arabs, and, in 1575, of the Turks, Tunisia contains numerous remains of antiquity, vast ruins, and evidences of its former fertility and great prosperity. Under Hussein ben Ali, who seized the country in 1705, Tunisia became virtually independent, although at times it was tributary to Algeria, and Turkish suzerainty was always acknowledged. In 1881 the French invaded the country, and on May 12 forced the bey to sign the treaty of Kassar-Said, subsequently strengthened by a convention signed June 8, 1883, under which the bey placed Tunis under French



Tunisia. Map of the French protectorate in North Africa

protection. Sidi Mohammed al-Amin (b. Sept. 4, 1881) succeeded as bey his cousin Sidi Mohammed al-Mounsaf, who abdicated May 15, 1943; he is descended from Hussein ben Ali. The country is administered by a French minister resident-general, who is responsible to the foreign office, with a cabinet of eleven heads of depts., eight of them French, three Tunisian. Each of 19 civil dists. has a French governor with Tunisian officials; there are also six military areas.

During the Second Great War Tunisia came under the control of the Vichy govt. after the Franco-German armistice, and remained so until the landing of the Allies in



Tunisia. Three Arabs of the country. Left, a sheik; centre, woman with her baby; right, a water-carrier

Morocco and Algeria and their advance into Tunisia led the Germans to fly in troops and occupy the city of Tunis and the surrounding country. An account of the fighting is given under Tunisia, Battle of (v.i.). Consult *La Tunisie*, J. Despois, 1931; *L'État Tunisien et le Protectorat Français*, 1925-1931, Fitoussi and Benazet, 1931.

Tunisia, BATTLE OF, 1942-43. The principal object of the Allied landings in N.W. Africa on Nov. 8, 1942, was to secure Tunis and Tunisia before Axis forces—either those retreating from Alamein or others landed across the Mediterranean—could do so. Those landings were the signal for the start next day of German landings by sea and by air, the first at El Oûina airport just outside Tunis; and these, unlike the Allied landings, were unopposed by the French. French opposition to Eisenhower's force lasted only two days (see North Africa Campaigns); but it gave the Germans that additional advantage over the Allies, whose nearest landing to Tunis was at Algiers more than 450 m. away.

By mid-Nov. the Allies had established a forward base at the port of Bône, some 60 m. from the Tunisian frontier. From Bône a coast road runs comparatively straight to Bizerta. It is not a good road, and traverses for most of its length deep scrub-covered valleys or high bare hills. A N.-S. road links near Souk Ahras with an inland road which runs E. to Béja, splitting there into three: the N. arm joins the coast road about 30 m. E. of Tabarca; the centre arm, incomplete in 1942, cuts through the deep valley of Sidi Nsir to Mateur; the third is the old Carthaginian road to Tunis by Medjez-el-Bab. At Medjez, 35 m. from Tunis, this third road forks, the N. fork reaching Tunis by way of Tebourba and Djedeida, the S. going straight there across low rolling hills.

British Parachute Drop

A British parachute bn. dropped on Nov. 16 at Souk-el-Arba in the wide Kroumirie valley, securing the airfield there without opposition. Commandeering French transport, the parachutists went forward next morning to Béja and, continuing to advance along the centre road, met the Germans 6 m. beyond Sidi Nsir. Meanwhile the British commander, Gen. Anderson, sent half his infantry (three bns.) with some 25-pdr. artillery along the coast road in an attempt to reach Bizerta. The other three bns. went along the wide and easy

main road from Béja to Medjez-el-Bab, in the hope of taking Tunis by frontal assault. Between them, through the defile of Sidi Nsir, Anderson sent a small, composite force of tanks with supporting elements.

Forty miles beyond Tabarca the northern force met German tanks, overcame them, and advanced a few miles farther to a little pass between two hills, named by the men "Green Hill" and "Bald Hill." There it was stopped by German parachutists well dug in and supported by mortars and heavy machine-guns. The southern force, in spite of German air superiority, pushed on and secured Medjez-el-Bab on Nov. 25. The centre force, also heavily bombed, reached Sidi Nsir, crossed the high hills by the half-made road in spite of mortar and anti-tank fire and mines, to secure Tebourba on Nov. 27.

Concentration of German Forces

By this time German forces, commanded by Gen. Walter Nehring, a tank specialist, were massed at Djedeida in prepared positions against which British, now reinforced by some American, troops thrust in vain, to be forced back through Tebourba to the hills N. of Medjez. On Dec. 8 the rains came; but in spite of the difficulties of tank warfare in the resulting mud, on Dec. 10 and 11 Nehring thrust in strength from Djedeida, and from Massicault to the S.W. towards Medjez. These attacks were repulsed, though a column of U.S. armour lost most of its tanks, much of its artillery, and a number of its vehicles to the mud. But the Germans left a garrison on Jebel Ahmera (soon to earn the name Longstop Ridge), a hill dominating the exits from Medjez. The 2nd Coldstream Guards, detailed to throw the Germans off the hill on the night of Dec. 22-23, succeeded in establishing themselves on the crest after severe and confused fighting. A U.S. bn. relieved them, was heavily counter-attacked, and, mistaking orders, withdrew from the crest. The 1st Guards bde. regained the summit on the 24th but, after bitter fighting, lost it again on Christmas Day. The mud was so bad that the Germans were left in position, the Allied troops falling back on Medjez. Hope of a quick seizure of Tunis had to be abandoned, and major operations postponed until the rain ceased.

New men and materials were reaching the Allies; but the Ger-

mans were also being reinforced, and Maj.-Gen. Jürgen von Arnim arrived to take command. On Jan. 3, 1943, the Allies attacked unsuccessfully in the Green Hill-Bald Hill area. On the 18th the Germans attacked from Pont-du-Fahs; at Bou Arada about 18 m. to the W., they were beaten off. In the valley of the Ousseltia they were held, but they were not repulsed until Jan. 23. On that day, the 8th army occupied Tripoli, and it was decided in Tunisia to try to occupy the narrow neck of land between the Chott Djerid, an enormous shallow salt lake, and the coast, in order to stop a junction of Rommel's forces retreating from the E. with those of von Arnim. A strong force assembled near Bou Chebka, to the S.E. of Tebessa, principal Allied base in the S., succeeded in advancing only as far as Station Sened, 10 m. W. of Maknassy. The Germans held a second advance from Sbeitla at the edge of the Faid Pass, and then on Feb. 14 swept through the pass, capturing Sbeitla on the night of Feb. 17-18. As a result of the loss of Sbeitla, the U.S. 2nd corps began to withdraw through the narrow Kasserine Pass on Kasserine. Gafsa to the S. was abandoned in conformity. On Feb. 20 the Germans thrust through the Kasserine Pass, sending armoured forces N. towards Thala, W. towards Tebessa. Both thrusts were held; and the Germans began to withdraw, followed—slowly because of great numbers of mines—by British and U.S. units. By the evening of the 28th the Kasserine Pass was in Allied hands again, and Sbeitla had been reoccupied. This, the last German attack in S. Tunisia, was under Rommel's command, and it gave him time and space for the withdrawal to the Mareth Line of his army of Egypt, which made no attempt to stand on the indefensible Tripolitania-Tunisia frontier.

8th Army's Entry into Tunisia

Patrols of the 8th army crossed the frontier in the last days of Jan. In accordance with decisions taken at the Casablanca conference between Roosevelt and Churchill, the 8th army after entering Tunisia came under Eisenhower's supreme command, Gen. Alexander assuming the fighting command of all Allied forces in the country from Feb. 19. On Feb. 15 the 8th army occupied Ben Gardane; on the 18th Medenine. An attempt to recapture Medenine on March 6—Rommel's last battle in Africa—failed. The battle of the Mareth

Line (*q.v.*), in which the Italian Gen. Messe commanded the Axis forces, followed; it was not over until March 28. The Axis lost heavily, but escaped annihilation, retreating to the Wadi Akarit, a dry gully lying a little beyond Gabes and running down to the sea. The 8th army paused for reorganization near Gabes. Then on April 6 it attacked the Wadi Akarit and, in fighting "heavier and more savage" than any since Alamein, drove Messe from it. On April 7 a patrol of the 8th army met a U.S. patrol 15 m. E. of El Guetar; the Allied armies from E. and W. had met across N. Africa. The Allies occupied Pichon on the 8th, Sfax on the 10th, Kairwan on the 11th, Susa on the 12th.

Messe reached Enfidaville on April 13 and joined von Arnim, who assumed command of all Axis forces left in Africa. Some quarter of a million Germans and Italians were in the "box" running from Enfidaville through Pont-du-Fahs, the hills E. of Béja, E. of Sedjenane to the coast some 10 m. E. of Cape Serrat. They were strongly entrenched in well-sited hill positions which they had had six months to prepare. At sea, however, the R.N. maintained constant watch, cutting down their seaborne supplies; in the air the Allies had complete superiority, and transport planes flying in petrol and reinforcements were shot down in numbers.

Strengthening of the 1st Army

Alexander decided that the 1st army was to make the main effort in the final battle, and seasoned troops from the 8th were transferred to it for this purpose. The battle began, however, on April 19 with a subsidiary attack by the 8th which took Enfidaville. For the rest of the battle, the 8th held a line just N. of that town. An Axis attack on the night of April 20-21 immediately to the E. of Medjez was defeated. On the 22nd the Allies attacked Longstop Ridge; in three days of the hardest fighting in Tunisia they captured it. In the N. an attack through the scrub country of the coast hills brought French African troops within 6 m. of Garaet Achkel, outermost of the two great lakes of Bizerta. Along the Sedjenane valley and up into the hills beyond Sidi Nsir the Americans thrust on April 23, smashing the main Axis defence line and opening the road to Mateur, entered May 3.

More reinforcements for the 1st army were taken from the 8th. On May 5 Bou Aoukaz, a dominating hill 4 m. downstream from Long-

stop and on the opposite side of the river, was attacked with strong air support. Fighting was severe, and the summit was taken by the 1st Irish Guards at the cost of many casualties. On May 6 massed artillery and air bombardment of the Axis positions followed, and two armoured divs. pushed forward, finding resistance "gallant and desperate" but disorganized. By nightfall they were in Massicault. At first light next morning they moved forward, and at 2.45 p.m. on May 7 entered Tunis, to be greeted with unrestrained enthusiasm by the population. An hour and a half later Americans entered Bizerta.

Isolation of Cape Bon Peninsula

After passing through Tunis, Allied armour wheeled down the road that runs across the base of the Cape Bon peninsula. It was held in the exceptionally strong position of the Hammam Lif defile by the Hermann Goering div., but on May 10 broke through to Hammamet. Next day infantry swept rapidly round the peninsula, encountering no opposition. On May 12, after a brief resistance, the forces remaining in the hills raised the white flag. The forces to the S. of the Allied wedge, larger than those to the N. and including six generals, had surrendered unconditionally on May 9. Among the remaining Axis forces in isolated pockets N.W. of Enfidaville, mass surrenders occurred on the 12th. Von Arnim surrendered to the commanding officer of the 2nd Gurkhas. He was taken to Alexander's h.q. at Le Kef where, says Alexander, "he still seemed surprised at the suddenness of the disaster. Gen. Messe delayed his surrender until the morning of the 13th; shortly before he had been informed by radio of his promotion to the rank of marshal. The troops in general surrendered to anyone they could find willing to accept their surrender. It was an astonishing sight to see long lines of Germans driving themselves, in their own transport or in commandeered horse-carts, westwards in search of prisoner-of-war cages." Some 250,000 men laid down their arms; 663 escaped, the German command having, in fact, made no effort to evacuate troops.

The British "1st army" which entered Tunisia in Nov., 1942, under the command of Lt.-Gen. K. A. N. Anderson, consisted of one incomplete infantry div. and one tank regt.; the div. was completed on Dec. 1; the 6th armoured div. was completed Dec.

15; the 48th div. reached the front in the first week of Feb., 1943, the 1st div. by March 22, the 4th div. in the second week of April. In Tunisia there were also the U.S. 2nd corps, of necessity raw to battle, and the French 19th corps, in Tunisia under Vichy, and regarded at first as of somewhat uncertain loyalty to the Allies. The Americans were directly under Eisenhower, the supreme commander; the French under Gen. Juin were responsible to Gen. Giraud. It was Jan. 25, 1943, before Anderson was made responsible for coordinating the whole small Allied force. In the final stages of the battle, on the other hand, notably close cooperation developed not only between army, navy, and air force, but also between the Allied groups engaged.

Trene Clephane

Tunja. Town of Colombia, in the dept. of Boyaca. About 80 m. N.N.E. of Bogotá, it is reached by road and rly. One of the oldest towns in America, it is remarkable for well preserved old Spanish buildings. Pop. 27,080.

Tunja OR TUNDJA. River of the Balkans. Rising in the S. slope of the Balkans Mts., it flows E. and then S. through a region much of which is a succession of gardens of roses, and joins the Maritza at Adrianople. Its length is about 150 m. The Tunja Valley produces large quantities of otto of roses.

Tunnel (Fr. *tonneau*, cask). Excavation underground to form a passage for conveying rail, road, or pedestrian traffic, sewage, water, cables, etc. Tunnels are also used in mining. The design and method of construction vary considerably, largely depending on the nature of the ground. When the material is loose, *e.g.* sand, silt, or shattered rock, it becomes necessary to support the sides and top of the excavation; in water-bearing strata, or when tunnels are driven at shallow depths below rivers, it is often necessary to use compressed air. Except for tunnels in sound rock, and when it is considered unnecessary to provide any special exposed surface, tunnels are lined with cast iron, concrete segments, concrete *in situ*, brickwork, or masonry, according to the uses to which the tunnels are to be put.

Deep tunnels are often driven by first sinking shafts to the required depth, thus providing working faces, and also means for removing the excavated material (spoil). In rock, small headings precede the main excavation. In soft ground such as clay, pneumatic spaders

are used, and in tunnels of large diameter it is customary to use a Greathead shield, which not only supports the ground until the lining is built, but also carries working platforms and movable tables

actuated by hydraulic jacks to give support to the face of the excavation. Most of the London underground rly. tunnels were constructed in this manner.

It is sometimes possible to solidify wet, granular ground by the injection of sodium silicate and calcium chloride in small measured doses, which give increased strength and impermeability. This is particularly useful in forming a temporary safe foundation under existing buildings, below which tunnels are being driven, to support the buildings before the tunnel lining is fixed. Cement grout is invaluable to fill voids behind tunnel linings and to seal fissures in rock through which water might flow. An important feature in tunnelling, especially where explosives are used, is the matter of ventilation; a supply of fresh air must be carried near the face, and the gaseous products of blasting and the exhaust air from pneumatic tools must be removed. In long tunnels used for road or rly. traffic, adequate ventilation must also be provided.

Tunney, JAMES JOSEPH (b. 1898). American boxer, known as Gene Tunney, born May 25, 1898. He was a rates clerk who won a boxing championship while in the U.S. army in France. He beat Jack Dempsey (*q.v.*) for the heavyweight championship of the world, Sept. 23, 1926, at Philadelphia; and again in a return match before



Gene Tunney,
American boxer

130,000 people at Chicago, Sept. 22, 1927. These were sensational contests, and Tunney would probably have lost them but for his cool thinking. Having knocked out a challenger, Tom Heeney, July 26, 1928, he retired from the ring undefeated. He married a grand-niece of Andrew Carnegie.

Tunny (*Thunnus thynnus*). Large fish, belonging to the mack-



Tunny. Large Mediterranean food fish, occasionally found in British waters

erel family. Common in the Mediterranean, it occurs round the U.K. The fish frequently grows to a length of over ten ft., sometimes weighs half a ton, and is a valuable food fish, with flesh which looks very much like beef. It is eaten both fresh and preserved in oil. See Bonito.

Tunstall. Market town of Staffs, England. In the heart of the Potteries, it is one of the five towns which form the co. bor. of Stoke-on-Trent, lying in the N. thereof. It has a rly. station. The Victoria Institute, 1889, contains a public library. The principal occupations are making earthenware and bricks; there are also coal and iron works in the neighbourhood. Tunstall was long a stronghold of Primitive Methodism. Pop. approx. 22,000.

Tunstall, CUTHBERT (1474-1559). English prelate. Educated in England and Italy, he entered the Church, and in 1511 was appointed chancellor to the archbishop of Canterbury, and bishop of London in 1522. He had been employed on various political missions since 1515, and



Cuthbert Tunstall,
English prelate

in 1525 and 1529 was special ambassador to the emperor Charles V. Given the see of Durham in 1530, Tunstall followed Henry VIII in his break with the pope, and in 1537 was appointed president of the council of the north. Temporarily losing his mitre under Edward VI, he was reinstated by Mary, but, refusing to take the oath of supremacy to Elizabeth, was imprisoned, dying in prison at Lambeth, Nov. 18, 1559.

Tupac Amaru (c.1740-82). A Peruvian revolutionary, whose real name was José Gabriel Condorcanqui, known as The Last of the Incas. He was born at Tinta, S. of Cuzco. For a time he ruled a district under the Spaniards, but in 1780 placed himself at the head

of an extensive and at first successful revolt against them. Eventually he was taken prisoner and, on May 18, 1782, at Cuzco was executed with barbarous cruelty, his family suffering a similar fate.



Tupelo Tree. Sprays of leaves and flowers. Inset, left, female flower and, right, head of male flower

Tupelo Tree or OGECHEE LIME (*Nyssa capitata*). Small tree of the family Nyssaceae, native of the southern U.S.A. It grows in swamps, and has alternate, oval leaves, cottony on the under-side. The small greenish flowers have the sexes separate, the males forming little heads, the females solitary. The plum-like fruits are red.

Tupman, TRACY. Character in Dickens's *Pickwick Papers*, one of the four "corresponding members" of the *Pickwick Club*. He is a middle-aged beau, extremely susceptible to feminine charms.

Tupper, SIR CHARLES (1821-1915). Canadian statesman. Born at Amherst, N.S., July 2, 1821, and educated in Edinburgh, he became a doctor. He entered the state legislature in 1845, was prime minister, 1864-67, and one of the fathers of the confederation of 1867. In 1870 he became president of the privy council of Canada, and under Macdonald was minister of inland revenue and of customs, and, in the 1878 ministry, in charge of public works and of rlys. He was high commissioner for Canada in London, 1884-87 and 1888-96, arranging the loan for the C.P.R. as finance minister in the interval. In 1896 for a few weeks Tupper was prime minister of the dominion. Then for four years he led the opposition in the house of commons. Knighted in 1879 and made a baronet in 1888, he spent most of his time in England in his last years, dying Oct. 30, 1915. Tupper published *Recollections of Sixty Years*, 1914.

Tupper, MARTIN FARQUHAR (1810-89). British author. Born in London, July 17, 1810, and educat-

ed at the Charterhouse and Christ Church, Oxford, he is remembered solely for his Proverbial Philosophy, 1838, a didactic work in blank verse, which at first attracted little notice, but eventually achieved extraordinary popularity, particularly in the U.S.A. Tupper also wrote mediocre verse, and was an indefatigable inventor. He died at Albury, Surrey, Nov. 29, 1889. *Consult* M. T., His Rise and Fall, D. Hudson, 1949.



Martin Tupper,
British author

Tu Quoque (Lat., thou also). An answer to an opponent, in which the imputing of some offence is answered by bringing exactly the same charge against the accuser. The schoolboy retort "You're another!" is an obvious instance.

Tura. River of Russia. Rising in the E. slope of the Urals in the region of Sverdlovsk, it flows S.E. into the prov. of Omsk, and after a course of 450 m. discharges into the Tobol, 70 m. S.W. of Tobolsk. The river is frozen from Nov. to May. The valley yields timber of good quality.

Turanian. Persian term for the non-Iranian nomads of central Asia. Philologists have applied it inexactly to the Ural-Altaic language-family, and to such unrelated tongues as Dravidian; ethnologists have intensified the confusion by still looser applications. During the First Great War a Pan-Turanian movement aimed at the political cohesion of the Ottoman Turks with their central Asian congeners. *See* Altaian.

Turban. Head-dress worn by Mahomedans. It consists of a scarf of cotton or silk wound round the



Turban as worn
in N. Africa

head, the manner of arranging the folds varying according to rank and country. The tarbush or fez, or a cap of similar description, is sometimes used as the foundation for a turban. Early in the 19th century the turban became fashionable among some European women. It was also adopted by some Indian army units. *See* Cap.

Turbary (late Lat. *turbaria*, fr. *turba*, turf). In law, the right to go upon another's land or to dig turf

upon it. The word is sometimes used to define ground upon which turf is dug.

Turberville OR TURBERVILL, EDWARD (c. 1648-81). Welsh informer. Having been employed in the house of the marquis of Powis, he served in the French army, 1676, and then studied at the English college at Douai. At the trial of Lord Stafford, 1680, he alleged that he had been importuned by the prisoner to kill Charles II. Turberville was likewise a witness at Shaftesbury's trial next year, in which he died on Dec. 18.

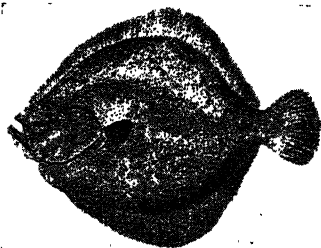
Turberville, GEORGE (c. 1540-c. 1610). English poet and writer. Born at Whitechurch, Dorset, he was educated at Winchester and New College, Oxford. He became secretary to Sir Thomas Randolph, whom he accompanied on his mission to Ivan the Terrible in 1568. Turberville wrote Epitaphs, Epigrams, Songs, and Sonets, 1567; *The Book of Faulconrie or Hawking*, 1575; *Tragical Tales*, 1587, from the Italian; and translated Ovid's *Heroical Epistles*, 1567. He helped to make popular Italian poetical models, and was a pioneer of English blank verse.

Turberville, HENRY DE (d. 1239). English soldier. A loyal follower of King John, he took part in the victory on behalf of Henry III over the French fleet in Dover Straits, 1217; was seneschal of Gascony, 1226-31 and 1234-38; and fought in the Welsh war, 1233, when he captured Carmarthen. In 1238 he was in arms for the emperor Frederick II against the Lombards, and was about to go on crusade when he died, Dec. 21, 1239.

Turbine. The various classes of this machine are described under the headings Gas Turbine; Steam Turbine; Water Turbine.

Turbine, RALPH DE (d. 1122). English primate. Also known as Ralph d'Escures, he became a monk of Seez, then abbot, and, settling in England in 1100, was made bishop of Rochester. Appointed archbishop of Canterbury in 1114, he is remembered chiefly on account of his refusal to consecrate Thurstan to the archbishopric of York unless the latter acknowledged obedience to Canterbury.

Turbot (*Rhombus maximus*). British flat food fish. Next to the sole, it is the most highly esteemed of the flat fish for the firmness and delicacy of its flesh. It is greyish-brown in colour, with darker spots, and the scales when present are very small and inconspicuous. A turbot may grow to over 3 ft. in



Turbot, the flat food fish caught off the British coasts

length. It feeds mainly on other fishes. The turbot fishery is carried on off the N.E. coast of England, usually beginning in May, trawling being practised. *See* Brill.

Turbulence. Name given to the irregular or "eddy" motion which appears in fluids, whether liquid or gaseous, when they flow past solid surfaces or when neighbouring streams flow past or over each other, provided that the velocity exceeds a certain level. There is no mathematical definition of turbulence; fluid motion is said to be turbulent when it is impossible to specify the details of the motion. The motion of the lower layers of the atmosphere is turbulent, e.g. the wind consists of a series of gusts and lulls.

Turco. Name given to Algerian riflemen. They belong to the regiments which constitute the native portion of the African infantry in the French army. Commanded partly by French and partly by native officers, their official description is *Tirailleurs Algériens*.

Turcoman OR TURKOMAN. Tribes of Turkic stock and speech, mostly in W. Turkistan and thus inhabitants of the U.S.S.R. Numbering some 290,000, they are found as far W. as the Caucasus, and there are outlying bands in Asiatic Turkey and across the Persian and Afghan frontiers. Hardy, thick-set, predatory, stock-breeding nomads of Altaian type, they form nine tribes, mostly dwelling in winter villages and summer encampments. Since the Russian subjugation in 1881 many Turcomans have adopted agriculture. *See* Turkmen.

Turenne, HENRI DE LA TOUR D'AUVERGNE, VICOMTE DE (1611-75). French soldier. Nephew of Maurice of Nassau, and grandson of William the Silent of Orange, he was born Sept. 11, 1611, at Sedan, was brought up as a Protestant, and joined the French army in 1630. He distinguished himself in the earlier French campaigns of the Thirty Years' War (q.v.),

and from 1641 onwards held the highest commands, although he was periodically superseded by



Vicomte de Turenne,
French soldier
After Latouze

Condé, a brilliant soldier in the field, but on a much lower plane than Turenne in the sphere of real generalship. In 1644-45, when Turenne was commanding the armies of the Upper

Rhine with much skill under great difficulties, Condé spoils his work by bringing upon their joint force a heavy defeat at Freiburg, and then stole credit by winning a lucky victory at Nördlingen. In 1646, however, Turenne, relieved from the embarrassment of his rival, conducted a brilliant campaign in which he made himself master of Bavaria in the last campaign of the war in Germany.

During the civil wars of the Fronde, 1648-52, when it was hard for Frenchmen to decide where their loyalty lay, Turenne changed sides between the rebels and the court. In 1650 he suffered at Rethel his only significant defeat, but in the last campaign proved decisively superior to Condé, winning the victory of the Faubourg St. Denis to regain Paris for the court. Against the Spaniards he won battles at Arras and Dunkirk, compelling them to sign the peace of the Pyrenees. Louis XIV appointed him marshal-general in 1661, and stopped short of making him constable of France only because of his Protestantism. As Turenne was received into the R.C. Church as late as 1668, his conversion scarcely seems due to a desire for secular advancement.

In the Dutch war, 1672, and against the German princes he again proved the greatest master of the art of war of his day. But when in 1674 he took the Palatinate, much hatred was aroused by his campaign of devastation. Then came his sensational winter march secretly through the length of the Vosges to crush the allies at Turckheim, Jan. 5, 1675, and recapture Alsace. Giving battle again on July 27 to Montecuccoli at Salsbach, he was killed early in a victorious action. Turenne was the early teacher of Marlborough, and his later campaigns were a model to Napoleon. Esteemed for daring and strategical skill by both enemies and allies, he has also left, on the whole, the reputation

of a man of noble character, appealing to all generations of Frenchmen. The best English biography is by T. O. Cockayne, 1853. That by Max Weygand was translated into English in 1930. Turenne's memoirs were published by P. Marichal in 1909.

Turf. Term used for the grassy surface of the soil; also the sods of earth and grass roots cut for various purposes. By association it is used for the sport of horse-racing and all its connexions. See Horse-racing.

Turfan. Town and oasis N.E. of the Tarim basin, Sinkiang. Situated in a depression 300 ft. below sea level, with a pop. of 50,000, mostly Mahomedan, it lies on the great highway from E. China to Kashgar and Central Asia. The chief article of commerce is cotton, irrigation being effected by karez, or underground channels. Explorations of its ruined Buddhist monasteries yielded remains and MSS. in the local Kuchan dialect.

Turf Club. London club founded in 1868, mainly for sportsmen. Its house is at 85, Piccadilly.

Turgenev, IVAN SERGEEVICH (1818-83). Russian novelist. He belonged to an old impoverished noble family, probably of Tartar ancestry, and was born at Orel. Educated in Moscow, St. Petersburg, and Berlin, he began his literary career by writing



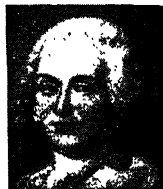
Ivan Turgenev

verses, which, however, he soon abandoned for prose, publishing his first sketch of peasant life in 1847. In 1850 he wrote his one popular play, *A Month in the Country*, and in 1852 came a volume of studies of peasant life, *A Sportsman's Sketches* (Eng. trans. 1895). This work showed that a new great Russian writer had arisen, and contributed to the emancipation of the serfs in 1861. Having suffered a month's imprisonment for an article he wrote on the death of Gogol in 1852 and two years' banishment to his estate, he left Russia in 1855, and, but for rare visits home, passed the rest of his life in self-imposed exile, living for the most part in Baden and in Paris.

Then followed half a dozen novels: *Rudin*, 1856; *A House of Gentlefolk*, 1859; *On the Eve*, 1860; *Fathers and Sons*, 1862,

which is generally accepted as the author's masterpiece; *Smoke*, 1867; and *Virgin Soil*, 1876. Turgenev died at Bougival, near Paris, Sept. 4, 1883. Most of his works have appeared in English translations. *Consult* Landmarks in Russian Literature, M. Baring, 1910; *La Vie de Tourguénieff*, E. Haumant, 1910; Turgenev, *The Man*, A. Yarmolinsky, 1927; *Tourguéniev*, A. Maurois, 1931.

Turgot, ANNE ROBERT JACQUES (1727-81). French statesman and economist. Born May 10, 1727, he was educated at the Sorbonne, and in 1761 became Intendant of Limoges. Holding that office for 13 years, he effected remarkable economic reforms in that district.



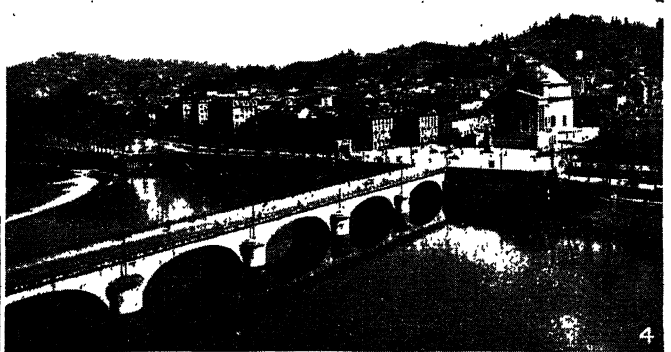
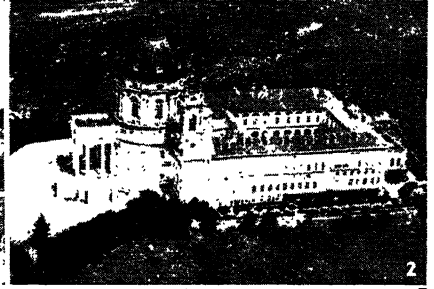
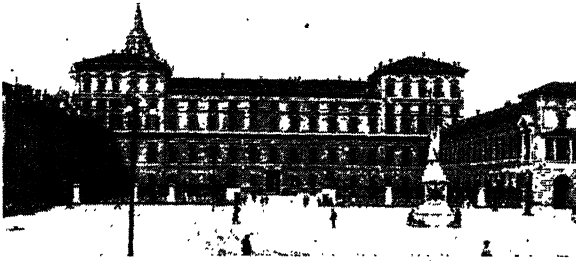
Jacques Turgot,
French statesman
Louvre

In Aug., 1774, he was entrusted by Louis XVI with the financial administration of France, taking office as comptroller-general.

Called to the ministry when France was unconsciously heading towards the Revolution, Turgot made a gallant effort to save the situation. He instituted drastic economies, which infuriated the classes who made their profit out of the existing system; he secured the king's support in abolishing the internal barriers to the freedom of trade in corn within the kingdom; he sought to establish a system of local self-government; and at the beginning of 1776 he attacked the *corvée*, the vested interests of the guilds, the *gabelle*, or salt tax, and the exemption from taxation of the privileged classes. Those classes, with the support of the queen, united in an attack upon the minister, which Louis was unable to resist. In May, 1776, Turgot was dismissed, and retired into private life. He died March 20, 1781. See Physiocrats.

Turgutlu or **KASSABA**. Town of Asiatic Turkey, in Manisa vilayet. It is about 30 m. E. of Izmir, on the rly. to Alashehr. Famed for melons, it exports them together with cotton, silk, and silkworms. The pop. of some 20,000 is mainly Muslim.

Turiamo. Seaport of Venezuela which in 1948 was in course of construction. It lies between Puerto Cabello and La Guaira. Quays were planned to accommodate the largest ocean liners, and the port, connected by highway with the Maracay-Valencia road,



Turin, Italy. 1. Royal Palace on Piazza Castello dating from 1660, which suffered war damage. 2. La Superga, the church where many kings of Sardinia are buried. 3. The 15th cent. Gothic cathedral of S. John the Baptist, containing interesting frescoes. 4. Vittorio Emanuele I bridge, one of four bridges in the city crossing the Po, showing the church of Gran Madre di Dio

was intended to play a leading part in Venezuelan commerce.

Turin (Ital. Torino). Most westerly prov. of Piedmont, Italy. It is bounded W. by France, N. by Aosta prov., E. by several provs., and W. by Cuneo; and is drained by the headstreams of the Po, which flow E. from the Graian Alps. It is mostly mountainous. Copper, coal, marble, chestnuts, cattle; silk, cottons, and linens are produced.

Turin (Ital. Torino; anc. Augusta Taurinorum). City of N.W. Italy, fourth largest in the country, and



Turin arms

capital of Turin prov. It is situated at an alt. of 785 ft. on the Po, which is here navigable. Genoa is some 80 m. S.E., Milan the same distance E.N.E., and the Mont Cenis Tunnel 54 m. W. Turin is a modern, well built, open, and unfortified city of rectangular plan with straight streets, parts of which are arcaded. The Piazza Castello in the N.E. is the focus of civic life. Here are the huge, unlovely Palazzo Madama, once a Roman gateway, damaged in air raids of the Second Great War; the Porta Decumana, later a castle; and a



Turin. Plan of the central districts of the Italian city

13th century fortress, enlarged at various dates.

From the Piazza radiate important streets, the chief, the Via di Po, leading to one of the four city bridges. N. of the Piazza is the plain brick royal palace, which dates from 1660, and also suffered war damage. Near by is the

duction to England it was supposed to have come from the Muslim east, then loosely called Turkey, and the bird was accordingly thus named ;

hanging from the forehead being extensible and erectile when the bird is excited. The bill and feet also are red.

The plumage in general is coppery bronze colour marked with black. There is a broad band of white at the tip of the tail-coverts and a similar band on the feathers of the tail proper. The male bears on the chest a hanging bunch of black bristles about 9 ins. long. A turkey is omnivorous, and attains a weight up to 50 lb. Mating takes place in March, and from nine to 15 or more brown-spotted, whitish eggs are laid. From this wild fowl the smaller domestic turkey originated, first appearing in Europe early in the 16th cent., when Spanish explorers brought it from Mexico.

Under domestication the turkey needs ample range and freedom. The chief domesticated breeds are the mammoth bronze, the Cambridge bronze, and the Norfolk black. The first is fairly hardy, and attains a weight of over 30 lb. The Cambridge bronze is slightly smaller. The small Norfolk black is the easiest to rear on a farm where no special attention can be devoted to it.



Turkey. Cock and hen of the breed domesticated in Britain. Left, wild turkey-cock from North America
By courtesy of the American Museum of Natural History

a similar error being perpetuated in France, where it was called *poule d'Inde*, bird of India, since contracted into *dinde* or *dindon*. It is distinguished by its large size, heavy body, and almost bare neck and head, which are bluish with red warts, the head covered with fleshy excrescences, one process



Gothic cathedral of S. John the Baptist (1492-98), with interesting frescoes and relics. On an eminence reached by cable rly, is the Superga, the burial church of the house of Savoy. The university was founded in 1404; part of its library was destroyed. The palace of the academy of sciences contains a picture gallery and a museum of antiquities. Roman remains show that there was a theatre. Altogether 31 churches and 67 palaces were more or less badly bombed late in 1942.

Manufactures include motor cars, steel and iron goods, silks, ribbons and velvets, cottons and woollens. Turin became a Roman colony under Augustus. It passed to the house of Savoy in the 11th century, and during 1861-65 was the capital of Italy. Liberated from the Germans April 27, 1945, by Italian patriots after two days' fighting, Turin was entered by Japanese-American troops of the Allied 5th army April 30. Pop. 712,983. See Arcade, illus. p. 553.

Turkey (*Meleagris gallopavo*). Large bird of the pheasant family (Phasianidae). It is a native of N. America from S. Canada to Mexico, but is now extinct in the wild state in the settled areas. On its intro-

TURKEY: REPUBLIC OF EUROPE & ASIA

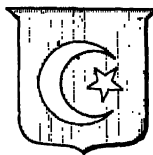
Edgar Stern-Rubarth, Ph.D.

An account of the republic of Turkey set up in 1923 is here followed by a history of the Ottoman empire from its origin to its downfall. See also Ankara; Istanbul; Izmir; Trabzon, and other towns; under Bulgaria; Greece; Persia, and other countries formerly under Turkish suzerainty; Abdul Hamid; Atatürk, M. K.; Osman; Solyman the Magnificent, and other noted figures in Turkish history. The fighting between Turks and the Allies during the First Great War is described under Dardanelles, Attacks on; Gallipoli Campaign; Kut; Mesopotamia, Campaign; Palestine; Salonica; see also Lawrence, T. E.

The Turkish republic, established Oct. 29, 1923, by one man with a few faithful assistants and disciples, has little in common with the former Ottoman empire, which, a conquering military power in the Middle Ages, had been ever more rapidly disintegrating for two centuries. The republic consists of the mainland of this former empire, Anatolia, and the prov. of (Turkish) Thrace, its last European territory, and contains the original stock of its once nomadic population, the Turks, with but small settlements of other races; the language and the flag, crescent and star in white on red, have not changed.

The republic of Turkey (Türkiye Cümhuriyeti) lies between lat. 36° and 42½° N. and long. 26° and

45° E. It covers an area of 296,107 sq. m. and has a growing pop. (1945) of 18,860,223; of these 1,493,976 live in European Turkey with Istanbul, pop. 845,316, and Edirne (Adrianople) as the biggest towns. Istanbul, capital of the empire, has been replaced as capital by Ankara, pop. 226,712, a provincial town on the plateau of Anatolia before 1923 with fewer than 40,000 inhabitants. Izmir (200,088) is the chief port in the Aegean, Adana (100,367) is the chief port on the S. coast. Bursa, Eskişehir, Gaziantep, Konya, Kaisariyeh, and Erzurum also exceed 50,000 inhabitants, but by far the majority of the population live and work in villages and small farming communities,



Turkey arms



Turkey flag. Red with white crescent and star

about four-fifths of all Turks still being peasants, and cultivating the soil in their age-old way—about 6 p.c. of the total area is under agriculture—or breeding horses, cattle, sheep, goats, poultry, etc. A law of 1929 turned them from tenants into owners of their land. Fishing and trading by sea are industries of the long coastline. The main part of Anatolia is a high plateau rising in the centre to 3,000 ft. and bordered by mt. ranges in the N., E., and S., with a narrow strip of plain along the N. and S. coasts, a wider strip in the W. There are large swamps and marshes and, in the centre, salt lakes and steppes; forests, chiefly in the E., cover 36,000 sq. m.; the mts. reach over 16,000 ft. in the E. in the highest point of the mts. of Ararat, and some 12,000 ft. in the centre in Mt. Argæus.

Climate, Flora, and Fauna

Turkey in Europe has a Mediterranean climate, the mean temp. of Istanbul ranging from 42° F. in Jan. to 74° F. in July. Asiatic Turkey is a region of varying climate. Heavy autumn and winter rains occur along the N. coast; summer showers decrease towards the E., and in the interior and south precipitation is confined to the cold season. Under maritime influences the coastal areas experience mild winters and cool summers; inland there are extremes of temp., e.g. the Jan. and July means at Mazara are 21° F. and 77° F. respectively.

Palm trees and cotton plantations flourish in the semi-tropical plain of Adana in the S.; Mediterranean plants and shrubs grow along the W. coast and the Straits. Alpine vegetation is to be found near the Black Sea to the E. and on the Transcaucasian border ranges; plants of the steppe in the centre. The animals of these different characteristic zones range from bear and wolf to jackal and bustard. Long-haired species of cat, goat, and rabbit take their name (Angora) from the capital; camels are bred in many parts; tobacco from the Black Sea area (Samsun, Trabzon) and the W. coast (Aidin, Izmir) has world-wide markets, and the large town of Afyon Karahisar N.W. of Konieh takes its name from the huge opium-producing poppy-fields in its prov. Turkey's exports include raisins and almonds, hazel nuts, olive oil, cotton and wool, figs and eggs, and carpets, most of them hand-woven in antique patterns either in the home or in factories near Istanbul and Izmir.

Within a quarter of a century Turkey developed considerable industry. Possessing valuable deposits of coal, lignite, chromium, manganese and magnesite, zinc, sulphur, antimony, marble, meerschauum, and some iron ore and copper, Turkey devoted great care and effort, from 1935, to the exploration of these resources and started digging oil wells and building power stations, cement and other works of basic industries. Textile, paper, iron, and ceramic industries, at first with Russian, then with western assistance, were created and a great programme of rly. building was vigorously put into effect. Thus, while at the end of the First Great

vilayet), each with an *ibay* (formerly *vali*) at its head; four *il* are in European Turkey. Their size varies between 1,400 and 11,000 sq. m., the largest being that of the capital Ankara.

Military service is obligatory for three yrs. and men between 21 and 46 are liable to be called to the colours. Peace-time strength is about 200,000 officers and men, war strength approx. 2 million. Military service is combined with education and craft training; men of the minorities—Armenians, Greeks, Arabs, etc.—are excluded from training in arms, but receive the educational training. Education, in fact, is one of the gov't's. main purposes; elementary



Turkey. Map showing the extent of the country as determined by the treaties of Sévres, 1920, and Lausanne, 1923

War there was but one through rly. line, that linking Istanbul with Syria and, by way of the Bagdad rly., Iraq, and a few unconnected lines inland from several coastal towns, by 1945 there were 4,339 m. of well-connected, state-owned lines covering the whole country.

ADMINISTRATION. The constitution, which has been amended several times, dates from April 20, 1924. It declared Turkey to be a republic and decreed that an assembly should be elected every four years. A law of 1946 gave men and women the vote at 22, made them eligible to sit at 30. Secret ballot was introduced by a law of July 10, 1948. The grand national assembly (Büyük Millet Meclisi) of 465 deputies returned in 1946 consisted of 397 members of the People's party, 61 Democrats, and 7 Independents. The national assembly elects the president of the republic who forms his cabinet from members of parliament, which has the power to dismiss the gov't. The president is elected for four years and can be re-elected.

The country is divided up into 63 depts., called *il* (formerly

education is in theory obligatory for boys and girls, and the adoption of Latin (instead of Arabic) characters from Dec. 1, 1928, made education simpler, but in 1935 only 2½ million could read Latin characters. There are secondary, higher technical, and teachers' training schools as well as the university of Istanbul and Ankara, founded 1900. Gymnastics and sport, under the Ottoman empire almost entirely neglected, are encouraged in all schools and training courses. The formerly numerous foreign schools—American, French, English, German—are rapidly vanishing; new ones are not permitted.

RELIGION. Most of the people are Sunni Mahomedans; a minority belong to the Shiite Muslim community. There are about 150,000 Christians, mostly Orthodox, and about 90,000 Jews. Religion of every denomination is tolerated but has no political standing or influence; the wearing of clerical garb is permitted only on special occasions. Religious schools, whose main teaching under the sultanate and caliphate was the reading and learn-

ing by heart of verses (*sura*) of the Koran, were abolished in 1928.

Turkish is the language of 87 p.c. of the people; Kurdish of 8 p.c.; Arabic 1 p.c.; Greek 0.8 p.c.; Circassian, Yiddish, and Armenian about 0.5 p.c. each. The people's houses, in every town, and a number of them abroad, with assembly halls, libraries, etc., help to unify and educate a nation formerly split into many classes and sects. In 1926, a code of law modelled upon the Swiss, and granting women equal rights, was introduced; so also was a new penal code. The introduction of social insurance and other up-to-date measures, and the abolition in 1934 of ranks and titles (pasha, bey, effendi, etc.) have contributed to unification and development. Addition of a family name was also made compulsory.

CURRENCY AND MEASURES. The unit of currency is the Turkish pound (£T), theoretically worth 18s. 6d. in British gold currency. The Turkish pound is divided into 100 piastres. From Jan. 1, 1934, the metric system was adopted for all weights and measures, formerly mainly of Arabic and Persian origin and very complicated. From 1925 the international calendar and clock were adopted.

LITERATURE AND ART. All through the Ottoman period, both literature and art ranked as branches of those of Islam. The Young Turk revolt of 1908 provoked the beginnings of a national literature, principally under the influence of Zia Gökalp. With the Kemalist reforms came poetry, drama, music, and art of specifically Turkish character. Authors like Halide Edib, Jacob Kadri, Fatih Rifki, and the poet Yahya Kemal Beyatli; and composers like Necim Kazim Akses, Hasan Ferid Alnar, U. C. Erkin, A. A. Saygun, C. R. Rey are promising representatives of a development which combines current western elements with autochthonous and traditional Turkish forms. (*Consult Anthologie des Ecrivains Turcs d'aujourd'hui*, 1935.)

HISTORY. Present day Turkey is the heir and the one time cradle of the Ottoman empire whose history comprises 6½ centuries—the first half devoted to growth, the second to decay. Migrating Turkish tribes comprising five groups spread from E. Asia to Europe, and—including Huns, Turkmens, Krim Tatars, Kirghiz, and others—invaded Asia Minor in the 11th cent.; the Seljuk tribe there estab-

lished its rule and was converted to Islam. Nomadic and loosely united, this tribe succumbed to Mongol invaders, one of its smaller tribal rulers, Ertoghul, however, making himself independent. His successor Osman, or Othman, founded, about Karahisar, a small state and is considered the founder of the Turkish empire named after him.

Assuming leadership of his clan 1288 and, in 1307, declaring his independence of the decaying Seljuk kingdom of Rum, East Rome, Osman handed to his son Orkhan (reigned 1326–59) a small but well organized state which the latter extended to the shores of the Sea of Marmara; fighting other Turkish tribes and the Greeks, conquering Gallipoli after crossing the Straits, winning over Christian peers, and setting up a court at Brussa (Bursa). Orkhan's son Murad I and his grandson Bayazid I spread their domain in Europe, conquering and turning into their capital Adrianople (Edirne) in 1361, beating Serbs and Hungarians and laying siege to Constantinople towards the end of the 14th century. An essentially military power, preserving many of their nomadic traits and virtues, the Turks yet had by this time a sensible and, in many respects, farseeing and tolerant regime created by Orkhan; their guards, the janissaries, were formed from the (fifth) sons of their Christian subjects, trained from early childhood in athletic and moral accomplishments at the sultan's palace, and, if qualified, admitted to the highest offices of the state.

Spread of Turkey into Europe

The advance of the Ottoman sultanate to world power was stopped, however, by Tamerlane's sanguinary invasion in 1402. Mohammed I and his son Mohammed II re-established the Turkish rule, Mohammed II taking Constantinople in 1453 and subsequently overrunning the whole Balkan peninsula. Mesopotamia and Kurdistan were taken from Persia; in the early 16th cent. Hungary was conquered and, with the exception of Belgrade, held by the Hungarians, turned into an Ottoman prov., so recognized, except for Transylvania and the Banat, by Austria in 1547. Bagdad was taken; suzerainty over Mecca and Medina was established; Egypt was won; and Selim I in 1517 adopted the title kalif (Prophet's deputy), hitherto held by the Abbaside Arab dynasty, and, though exercising

towards subjects of other religions more tolerance than any other contemporary rulers, he and his successors claimed the leadership of all Mahomedans. Under Solyman the Magnificent (1520–66), who gave the Turks a constitution based upon the feudal system, the army, and the Byzantine administration, the Ottoman empire reached its peak about 1560, having treaties with France, Venice, and other Western powers. Solyman made the first Turkish attack on Vienna in 1529.

Reduction in Sultans' Power

A defeat of the Turkish fleet at Lepanto, 1571, by a Christian league, of which Spain and Venice were the chief members, was the first serious setback. Intrigues by ambitious grand viziers under weaker rulers, assassinations of potential successors, plots of the janissaries reduced the power of the sultans. The recovery of Persia under its energetic Abbas I (1587–c. 1628) cost Turkey Mesopotamia and parts of Armenia. But for another century the empire held its own, thanks chiefly to capable viziers (among whom members of the Koprili family were outstanding), although former vassals gained steadily more independence in Kurdistan, in the Lebanon, in Crete. Dynastic strife, however, the consequence of the Turkish inheritance law which established not the eldest son of a sultan, but the oldest male member of his family as heir presumptive of the throne, harem life, and luxury undermined an originally vigorous regime. Thus, the 17th century saw no less than 10 different sultans of whom one only, Murad IV (1623–40), is worth mention.

The salient feature of that century was the defeat of the Turks by the Hapsburg empire and their retreat in Europe. After the loss of the battle of St. Gothard on the Raab, 1664, Mohammed IV attacked Vienna with a huge army in 1683, and was defeated. Successively Hungary and Transylvania were lost, Poland took the Ukraine and Russia the Turkish Black Sea territories, including Azov; the Venetian conquest of S. Greece (the Morea) had to be accepted. Treaties with western powers took the form—and the name—of capitulations, and encroached upon many formerly sovereign rights of the empire. Jealousy among its western opponents rather than the recovery of its own strength preserved Ottoman power through the 18th century. The Turks fought with varying fortunes

against Austria; suffered heavy territorial losses, *e.g.* under the Passarowitz peace of 1718; enjoyed temporary success as allies of Charles XII of Sweden against the tsar; but from this time Russian pressure became Turkey's principal danger. It took the form of a claim to protect the Orthodox Christian subjects of the sultan, and a demand for the re-erection of the cross on S. Sophia; but it aimed at the Straits, as a way into the open seas. By the peace of Kuchuk Kainarja, 1774, Russia won a protectorate over Moldavia, Wallachia, and the Christians in Turkey, and regained the Crimean peninsula.

Attempts at Reform

France, who, with rare exceptions, had maintained friendly relations with Turkey, clashed with her over Bonaparte's Egyptian expedition, which, in effect, encouraged all the great powers to consider the Ottoman empire as its prey. Mehemet Ali, its Egyptian vassal, made himself independent and established his dynasty in Cairo; Serbia in 1804, Greece in 1821 emancipated themselves.

The necessity for drastic reform became obvious: Abdul Mejid (1839-61) tried to transform the old empire on western lines, his predecessors having taken on French and Prussian officers, abolished the corps of janissaries (massacred 1826), and reorganized the armed forces. Abdul Mejid established the full equality of all his subjects, whatever their race or religion, abolished the farming of taxes, and promised other reforms, realized only partially—the rival great powers interfering. This, in particular, was the case when Russia insisted upon her right of intervention on behalf of her protégés. Intervention, in favour of Turkey, by the western powers, led to the Crimean War (*q.v.*) of 1853-56, to more Turkish reform projects, and to loans from Europe. A new constitution, western in form, with a parliament of two chambers, and a responsible cabinet, was promulgated Dec. 23, 1875, under Abdul Aziz, who died six months later. Abdul Hamid (1876-1909), who promptly abolished it, is remembered as one of the empire's worst tyrants. The Young Turk movement, which aimed at transforming Turkey into a democratic state, was the result of his tyranny. Founded in 1876, it gained the support of the younger army officers from 1900 and led in 1908 to a revolt which forced the sultan to restore the

constitution and, in 1909, to abdicate. Austria-Hungary annexed Bosnia-Herzegovina, 1908; Bulgaria declared her independence, 1909; Tripoli was lost to Italy, 1912. The Balkan wars of 1912-13 left Turkey with only (Turkish) Thrace in Europe. The Young Turks, led by Enver Pasha, Talaat Pasha, and Djemal Pasha, decided in 1914, after some hesitation, to take the German-Austrian side in the First Great War. Badly equipped and poorly supplied, the Turks fought bravely, as always, and, in the defence of the Dardanelles, at Kut-el-Amara, and elsewhere had some remarkable successes. But the empire disintegrated during, and as a result of, this war, large parts of it being occupied by the Allies. After the Mudros armistice, Oct. 30, 1918, the last sultan, Mohammed VI, was forced to sign the treaty of Sévres, Aug. 10, 1920, which left him Anatolia, with Constantinople (Istanbul) and Smyrna (Izmir) under foreign control.

Rise of Kemal Atatürk

The aims of the Young Turk committee of unity and progress, of uniting the heterogeneous peoples of the Ottoman empire as a religious community but under a new, progressive regime, had proved unattainable during the war. Nationalism, confined to a homogeneous Anatolian state, replaced this ideal and led *e.g.* to adventurous enterprise on Russian soil. A small group of Turkish officers, led by Gen. Mustapha Kemal Pasha (later Atatürk, *q.v.*), went to Anatolia in May, 1919. At two nationalist congresses, held July-Aug. at Erzerum, and Sept. at Sivas, Mustapha Kemal was given a mandate to liberate, with the remnants of the Turkish army, the occupied country and to resist a landing at Smyrna. He succeeded up to a point and, after dissolution of the Constantinople parliament by the Allies, April 11, 1920, received the backing of many deputies who had come to Ankara. On April 23, 1920, he opened there the grand national assembly, which accepted him and his supporters as a provisional govt. Backed by Ismet Pasha (later İnönü), Rusht Bey (later Aras), and other gifted and patriotic men, he at once began instituting radical reforms.

In his first endeavour—to rouse the patriotic spirit and the faith in a rebirth of the nation—Mustapha was aided by a Greek military enterprise meant to enlarge the Greek base at Smyrna; while inter-allied disagreements gave

him the chance to rid the country of French as well as Italian occupation forces. In an indecisive battle at the Sakaria river, Aug. 23 to Sept. 12, 1921, and a brilliant offensive, Aug.-Sept., 1922, he decisively defeated the Greek armies on Turkish soil. All other allied forces soon vacated Anatolia.

A year later, on Oct. 29, 1923, the national assembly proclaimed Turkey a republic, and elected Kemal its first president. The caliphate was abolished, 1924, the religious colleges and courts were closed. The fez was forbidden, polygamy (already rare) was abolished. Women were granted the same rights in law as men, and in 1934 received the franchise. Another law of 1934 compelled all Turks to adopt a surname.

Treaty of Lausanne

A peace treaty negotiated by the foreign minister Ismet (later İnönü, *q.v.*) was signed at Lausanne, July 24, 1923. It recognized the new govt., liberated Turkey's soil within her ethnic borders, demilitarised the Dardanelles and Bosphorus straits, and provided for an exchange of populations with Greece. The last drastic, though ultimately successful, operation involved 1½ million Greeks from Turkish, half a million Turks from Greek, soil. The Montreux convention, 1936, revised this treaty by giving Turkey full sovereignty over the straits. This was confirmed in 1946.

On Nov. 10, 1938, Kemal Atatürk died. His closest collaborator Ismet İnönü was elected as his successor. During the Second Great War Turkey observed an armed neutrality until March 1, 1945, when she declared war on Germany and Japan in order to qualify for admission to the U.N.

The unbroken rule of the People's party, founded by Kemal in 1923, was broken at the elections of 1950, which gave the Democratic party 408 seats out of 497. İnönü himself, defeated at Ankara, was returned for Malatya. Only one member of his last cabinet was elected. The new assembly chose as third president of the republic Celal Bayar, leader of the Democratic party.

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Modern Turkey, J. Parker and C. Smith, 1942; The Rising Crescent. E. Jackh, 1942; Turkey, B. Ward. 1942; Life in Modern Turkey, E. W. F. Tomlin, 1946.

Turkey Buzzard (*Cathartes aura*). Vulture of the family Cathartidae. It is found from Sas-

satian Turkey to the Gulf of Persia. Turkish bath was introduced into London in 1860, by a Turk named Mahomet, who also started massage. See Baths.

Turkistan or **TURKESTAN**. Conventional name for a huge region, variously defined, in central Asia.

A W. and an E. division are generally recognized.

W. Turkistan comprises the regions formerly known collectively after the tsarist conquests in the 1860s as Russian Turkistan, besides the northernmost prov. of Afghanistan. Under the

imperial regime four Russian provs., Ferghana, Samarkand, Syr-Daria, and Semirychensk, aggregating 421,000 sq. m., with a pop. of 6,685,000, constituted the governor-generalship of Turkistan, administered from Tashkent. In 1917 they were declared an independent republic. With this territory were sometimes reckoned Transcaspia, the Khiva khanate, and the emirate of Bokhara. The whole territory is now divided among five republics of the U.S.S.R., Kazakh, Kirghiz, Tadzhik, Turkmen, and Uzbek, each of which has an entry in this work. There are about 700,000 sq. m. of desert, 40,000 sq. m. of indifferent grassland, and only 11,000 sq. m. of cultivated land.

Afghan Turkistan, between the Oxus river and the Hindu Kush, roughly corresponds with the ancient Bactria. The W. Pamir glaciers, culminating in Kaufmann Peak, 23,386 ft., and the N. slopes of Hindu Kush, not less lofty, furnish the water supply of the Amu-Daria (Oxus) and Syr-Daria (Jaxartes), which fall into the landlocked Aral Sea. Between them an immense loess region, the ancient Sogdiana, is traversed by the Zarafshan. This river, after replenishing the innumerable canals on which the age-long marts of Samarkand and Bokhara depend, disappears in marshland several miles short of its former confluence with the Oxus.

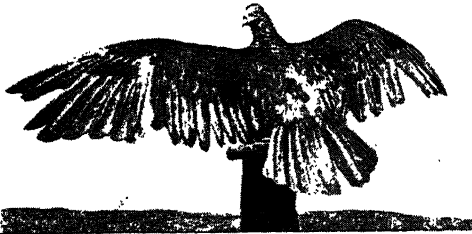
Throughout recorded history the population has been a medley of Turanian and Iranian elements. The uplands and the steppes are occupied by Altaian nomads, especially Kirghiz and Turcomans, the plains by Uzbeks. Iranian Tadzhiks, mostly Sunni Muslims,

occupy the towns, Sarts are the resultant of constant intermixture of all these stocks. Kirghiz cattle and sheep, and Turcoman horses, furnish the nomadic wealth. The crops include wheat, barley, lentils, rice, lucerne, and latterly cotton. Despite shortage of forest trees—both cause and effect of the progressive desiccation—there are many garden fruits; mulberry is grown, especially near Ferghana, for silk production. Mineral deposits are hardly worked, because of the lack of fuel.

E. or Chinese Turkistan comprises that portion of Sinkiang prov. lying S. of the Tian-Shan ranges, beyond which extend the Kulja and Zungaria valleys. The prov., created after Yakub Beg's short-lived kingdom of Kashgaria was suppressed in 1877, has a total area of 705,962 sq. m. with a pop. of 4,360,000. It is separated on the S. from the Tibetan plateau by the Kwenlun ranges, flanked by the Astin-tagh or Altyn-tagh, and from Kashmir by the Karakoram massif. Its E. boundary, cutting across the W. flanks of the Gobi desert, separates it from the Mongolian plateau and Kansu and Chinghai provs. On the W. the Pamir plateau, culminating in the peak of the Mustaghata, 24,400 ft., cuts it off from W. Turkistan.

Within this mountain rim, traversed by seven passes ranging from 4,500 ft. to 18,500 ft., lies an arid depression, sinking to 200 ft. below sea level at Turfan. Its W. half, the Taklamakan desert, is surrounded by the great curve of the Tarim. This river, after a steep descent to the Yarkand plain, flows for 1,000 m. into the Lop-nor marshes, collecting in its course scanty contributions from 60 streams. Round the desert fringe stand the urban oases of Kashgar, Yarkand, and Khotan, which carry on a trade in silk stuffs, coarse cottons, felts, carpets, gold, and jade.

ARCHAEOLOGY. Until the middle of the 19th century Turkistan was to Europeans an unknown land, save for the narrative of Marco Polo, who in the 13th century visited the Lop desert, Kashgar, Yarkand, and Khotan. In 1863 Vambéry crossed the Turcoman desert, penetrating to Khiva, Bokhara, and Samarkand. In 1868 Shaw and Hayward reached Yarkand, and in 1870 Trotter mapped E. Turkistan for the first time. Przhevalsky, crossing the Tian-Shan in 1877, was the first European since Polo to reach



Turkey Buzzard, in Jamaica called John Crow, sunning itself with wings outspread

catchewan to Tierra del Fuego and the Falkland Isles. It is mainly black, with whitish bill and a tuft of bristles in front of the red eye. The head and upper neck are naked, the crimson skin smooth. In Jamaica the bird is known as John Crow. There are two other species: *C. burrovianus*, from Mexico to Brazil, with orange head and neck and the nape feathered; and *C. perniger*, of the Amazons, with yellow head and neck. Carrion feeders, the birds act as scavengers, and are not known to be eaten by any people. See Vulture.

Turkey Carpet. Floor covering of woven pile made in Asiatic Turkey. It forms one of the best-known Oriental carpets, but is of coarser texture than the Persian, from which it differs slightly in the method of knotting. The industry centres largely round Izmir, but is carried on privately in most parts of Asia Minor. See Carpet.

Turkey Red. One of the alizarin dyes. The fibres of the fabric are mordanted with metallic salts, and then dyed in a separate bath of the colouring matter. The metallic hydroxide for Turkey red is that of aluminium. Turkey red oil is sulphonated castor oil, prepared by the action of sulphuric acid on castor oil. It is used as a fatty acid mordant in Turkey red dyeing. See Alizarin; Dyes.

Turkish Bath. Hot air bath. The temp. varies from 116° to 165° F., inducing copious perspiration, which clears the skin and eliminates noxious matter from the blood. The air bath is followed by soaping, washing, shampooing, massage, and cooling in rooms of suitable temp. before clothes are resumed. The first

Lop-nor. Two years later the botanist Regel first saw the Turfan oasis.

In the course of four expeditions, between 1890 and 1908, Hedin made important additions to our knowledge of Gobi, E. Turkistan, and Tibet. He drifted down the Tarim, discovered the ancient Loulan, and expounded the wave-like action of the desert dunes. Although the Forsyth mission to Kashgar in 1873 heard rumours of Lop-nor's buried cities, nothing resulted until Bower acquired in 1889 some birch-bark MSS. emanating from Kucha, north of the Tarim basin. Simultaneously some stone inscriptions in Turkish and Uiguric were discovered in the Orkhon valley. In 1892 de Rhins secured MSS. at Khotan. Archaeological work inaugurated in 1897 round Turfan by Klements and Donner witnessed to the Uigur domination of the 9th-12th centuries, while Hedin reported sand-buried ruins between Khotan and Lop-nor. From 1902 Grünwedel and von Lecoq worked at Turfan and Kucha, and Pelliot in 1906-09 secured important MSS.

Greatest achievements of all were those of three British expeditions under Stein in 1900, 1906, and 1913.

The priceless remains secured for the British Museum and Delhi include thousands of pieces of stucco ornament, fresco panels, wood carvings and implements, metal objects, and woven fabrics. Paper, wood, and other materials bear inscriptions in Sanskrit, Chinese, and Tibetan, besides three vanished Indo-European dialects, Sogdian, Khotanese, and Kuchean, with Manichaean and Nestorian texts.

Exploration of the Pamir region has revealed a primitive Indo-European dialect antedating the separation of Sanskrit from Iranian speech, besides the purest types of Aryan stock. Russian workers have been active in exploring their share of the territory. Consult The Marches of Hindustan, D. Fraser, 1907; Explorations in Turkestan, R. Pumpelly, 1908; The Pulse of Asia, E. Huntington, 1908; Turkestan, W. E. Curtis, 1911; and works mentioned under S. Hedin and A. M. Stein.

Turkmen, OR TURKMENISTAN. Constituent republic since 1925 of the U.S.S.R. It has Afghanistan and Persia to the S., the Caspian to the W., and elsewhere touches the Kazakh, Kara-Kalpak, and Uzbek republics. Its area is 189,370 sq. m.; pop. approx. 1,254,000; capital, Ashkhabad, or

Poltoratsk; most historic city, Merv; chief seaport, Krasnovodsk, which is also the terminus of the Transcaspian rly. The country mostly fell under Russian authority with the storming of Geok Tepe in 1881. Most of the people are of Turcoman stock, many retaining their nomadic habits, and are Muslims of the Sunnite sect.

The main occupation of the people is agriculture, and much of the land is artificially irrigated. Turkmen produces wool, cotton, and Astrakan fur. Carpets are woven. A special breed of horses and the Karakul sheep, bred here, are famous. Three-quarters of the area of the republic is occupied by the Kara Kum desert, but this is being gradually rendered fertile by irrigation from the waters of the Amu-Darya river, and by tapping subterranean water supplies. The black sands of the desert also cover deposits of magnesium, coal, and salt, and considerable chemical and other industry has been developed since 1925. Some 50 research institutes operate in the republic, administered by the Turkmenian branch of the U.S.S.R. academy of sciences.

Turk's Cap. Popular name for the common species of *Melocactus* (*q.v.*) and also given to the Martagon lily. See Lily.

Turk-Sib Railway. Name given to that branch of the Trans-Siberian rly. running from Novosibirsk in Siberia to Tashkent in Uzbek S.S.R. (Russian Turkistan). Opened in 1930, it carries cotton from Central Asia to the N. and timber from Siberian forests to the S. The Russian film Turk-Sib was made during the construction of the line.

Turks Islands. Group of small islands in the British W. Indies. They lie S.E. of the Bahamas, and with the Caicos Islands form a dependency of Jamaica. Grand Turk, 7 m. long by 2 m. wide, is the seat of government and about 1,693 inhabitants. A hurricane on Sept. 14, 1945, did immense damage to the islands.

Turku. This is the modern name of the historic Finnish seaport Abo; and Turku-Pori is that of the prov. of Abo-Björneborg. The old names are preferred in this Encyclopedia.

Turmeric. Rhizome of *Curcuma longa*, a perennial reed-like plant of the sub-continent of India, largely cultivated in tropical countries. Turmeric, when powdered, has a bright yellow colour and a hot, peppery taste.

It is the most important constituent of curries, and is used in India and China for dyeing cotton and silk. A tincture of turmeric is used in making a paper which is a test for alkalis and boric acid.

Turn. In music, an ornament consisting of a given note alternated with the note next above it in the scale, and with the semitone below, the whole forming a group of five notes. The turn may be upon or after the note.

Turnbuckle. Coupling screwed at both ends, one end having a right-hand and the other a left-hand thread, to which the ends of two bars are screwed. By turning it the screw threads enter farther into the screwed sockets, and the bars are drawn nearer together. Turnbuckles are principally used for applying tension to tie bars and steel-wire ropes in which the initial tension is insufficient or liable to vary.

Turner, Sir Ben (1863-1942). British trade unionist. As a boy at Holmfirth, where he was born Aug. 25, 1863, he worked at the domestic hand loom, earning 3½d. a day when aged nine. He became prominent among the textile workers in Yorkshire and a delegate of their union at 18. Unpaid secretary of the union from 1902, he was Labour M.P. for Batley and Morley, 1922-24 and 1929-31, being in charge of the mines dept. in the second Labour govt. President from 1922 of the national union of textile workers, and founder of the Yorkshire federation of trades councils, he was chairman of the T.U.C. in 1928 and knighted 1931. He died Sept. 30, 1942.

Turner, Charles (1773-1857). British engraver. Born at Woodstock, he studied at the R.A. schools, and practised aquatint, stipple, and mezzotint engraving, obtaining most success in the last. He was elected A.R.A. in 1828, and died Aug. 1, 1857. Engravings after J. M. W. Turner, Hoppner, and Lawrence may be cited.

Turner, Eva. Contemporary British singer. A native of Oldham, she studied at the R.A.M., and having joined the Carl Rosa opera co. in 1916, became its prima donna until 1924, when she was engaged by Toscanini to appear at La Scala, Milan. For an English artist she won unusual



Eva Turner,
British singer

admiration in European capitals, achieving world fame after her performances as Turandot and Aida at Covent Garden in 1928. Her powerful soprano voice was at its best in Wagner, her most famous rôle being that of Brunhild in *Götterdämmerung*.

Turner, Sir George (1836-1915). British bacteriologist. Educated at Cambridge and Guy's Hospital, he entered the S. African civil service as a medical officer of health in 1895. He devoted special attention to the rinderpest cattle plague, a serious outbreak of which occurred in 1896. The Turner serum stamped out the outbreak within a year, and was successful with another epidemic in 1901. Turner became medical officer of health for the Transvaal in 1900, and made important researches into leprosy at Pretoria. Resigning in 1908, he was knighted in 1913, and died at Colyton, Devon, March 12, 1915.

Turner, Joseph Mallord William (1775-1851). British painter. Son of a barber, he was born near Covent Garden, London, on April 23, 1775, and was educated in small schools in London, Brentford, and Margate. From early boyhood he showed promise of his artistic future, spending much time sketching with his friend, Thomas Girtin (*q.v.*), and in 1789 entered the R.A. schools, exhibiting in 1790 a drawing of Lambeth Palace. He then travelled widely in England, producing many architectural drawings, mostly of the great cathedrals, for publication as engravings, and in 1799 was elected A.R.A. In that year he exhibited five oil paintings, although hitherto known chiefly as a draughtsman and painter in water-colours. In 1802 he became R.A., and paid his first visit to France and the Alps, showing his oil painting of Calais Pier, 1803, with *The Shipwreck*, in similar manner, in 1805.

In such paintings as the last, the influence of the Dutch seascape painters, notably of Van de Velde, is marked, though they are by no means imitative; for Turner suffused his paintings in this genre with a strain of romantic turbulence which the Dutchmen did not know. The influence of Claude and Poussin, again, was profound on Turner's development; the inspiration of these masters may be seen in *Crossing the Brook*, 1815; *Dido Building Carthage*, 1815; *Childe Harold's Pilgrimage*, 1832.

To fuller expression he was gradually finding the way through his developing sense and mastery

of vivid and moving colour effects. In 1829 came *Ulysses Deriding Polyphemus*, with a riotous exuberance of rich colour new to English painting. Other works showing like qualities of those effects of massed and variegated colour which have come to be



After
Charles Turner

J.M. Turner

termed "Turneresque," appeared in 1838-39, *The Fighting Téméraire*, and *Modern Italy*, where a classic composition is blended with romantic colour treatment.

Meanwhile he had been travelling in England, Scotland, France, Switzerland, and Italy, and, selling but few paintings, earned a considerable income from his engravings. In 1807, partly inspired by the example of Claude's *Liber Veritatis*, he began the *Liber Studiorum*, a collection of parts of five plates each, designed to illustrate landscape composition, grouped under the heads of historical, mountainous, pastoral, marine, and architectural. For this work he made sepia drawings, transferred to copper partly by himself, partly by other engravers. Its publication continued until 1819, when 70 out of the 100 projected plates were issued. The combined line and mezzotint plates of the *Liber*, however, had not the popularity of his line engravings.

From about 1840 came a remarkable change in his style. More and more he concentrated attention on the suggestive effects of colour, whether glowing and brilliant, as in the *Burial at Sea*, 1842, or the cold greys of the much-discussed *Snowstorm*, a seascape of 1842. He continued this tendency to leave behind him the form and composition of his earlier work, and some

of his late painting almost seems to foreshadow Impressionist work. Here should be mentioned for 1844-46 *Light and Colour: Rain, Steam, and Speed*; several Venetian pictures; and *Undine*.

In 1843 Ruskin attracted attention by his high praise of Turner in face of much adverse criticism. The artist's last years, however, were spent in diminishing health and determined secrecy; he lived for a time under the assumed name of Booth in Chelsea, where he died on Dec. 19, 1851, being buried in S. Paul's cathedral. His property was the cause of long litigation. In the end the R.A. received £20,000 of the total effects of £140,000. His pictures and drawings, the latter numbering nearly 20,000, passed to the nation, and the Turner galleries at the Tate Gallery contain most of his great works, a few being in the National Gallery. At the Tate are the paintings long stored in the cellars of the National, but brought out in 1906, when their astonishing qualities of "impressionist" colour made some stir. Turner's reputation has perhaps suffered from his later vagaries, and from the undiscriminating praise which Ruskin's influence stimulated. But in spite of all, a study of his paintings and, no less important, of his water-colours, leaves him unchallenged as the English painter whose sense of the poetic value of landscape and whose command of blended colour remain unsurpassed.

Bibliography. Among many *Lives* may be mentioned those by G. W. Thornbury, 1877; W. C. Monkhouse, 1879; Sir W. Armstrong, 1902; H. Townsend, 1923; A. J. Finberg, 1939. Consult also *Modern Painters*, J. Ruskin, 1843; T.'s *Liber Studiorum*, W. A. Rawlinson, 1906; T.'s *Lectures on Perspective*, ed. D. S. MacColl, 1908; T. the Painter, B. Falk, 1938.

Turner, Walter James (Redfern) (1889-1946). British poet and critic. Born Oct. 13, 1889, at Melbourne, Australia, where he was educated at the Scotch College, he came to Europe in 1910, travelling on the Continent until 1914. During 1916-18 he served in the R.G.A. Music critic of the *New Statesman* 1916-40, he was literary editor of the *Daily Herald* 1920-23, making the book page an outstanding feature of daily journalism through the standing of the writers he invited; and of the *Spectator* from 1942 until his death in London, Nov. 18, 1946.

He published his first book, *The Hunter and Other Poems*, in 1916; *The Dark Fire*, 1918, and *Paris*

and Helen, 1921, led critics to see in him a poet of rare merit, who, using old forms, could create new effects; he was to produce further good poetical work in *Landscape of Cythera*, 1923, *The Pursuit of Psyche*, 1931, and other vols. Selected Poems appeared 1939. The poem *Romance* has found its way into many anthologies.

His essays in musical criticism, some of them republished in book form in *Music and Life*, 1921; *Variations on the Theme of Music*, 1924, were fresh and stimulating, with a dogmatic tone oddly at variance with his keen but courteous manner in personal argument. He published studies of Beethoven, 1927; Wagner, 1933; Berlioz, 1934; and Mozart, 1938. The faintly autobiographical novels *Blow for Balloons*, 1935; *Henry Airbubble*, 1936; *The Duchess of Popocatepetl*, 1939, were witty, lively, and full of unexpected twists.

Turners' Company. London city livery company. It was granted a charter in 1604, and though its activities have been curtailed, it has done much to promote the different branches of the art of wood and metal turning. A hall in Philpot Lane, destroyed by the Great Fire of



Turners' Company arms

1666 and rebuilt, was held until about 1737, when a new hall was acquired on College Hill, to be sold in 1766. Among members have been Baron Armstrong, Bessemer, Sir W. Siemens, Sir J. Whitworth, Sir Benjamin Baker, Lord Leighton, Sir E. Poynter, Leopold II of Belgium, Gladstone, Sir Henry Stanley, Lord Cadman. The office is at Apothecaries' Hall, Black Friars Lane, E.C.4.

Turnham Green. District of Greater London in the Middlesex bor. of Brentford and Chiswick. It is served by District line, and by buses and trolley buses. On Nov. 13, 1642, the royalist forces were checked here on the way to London, and Charles I had to fall back on Oxford. The 1st Baron Heathfield, defender of Gibraltar, and Wainwright, the poisoner, were residents, and at the Old Pack Horse Inn, in 1696, Sir G. Barclay and others plotted to assassinate William III. Cricket is still played on the green.

Turnhout. Town of Belgium. In the prov. of Antwerp, it lies in the flat Campine Anversoise, 33 m.

by rly. E.N.E. of Antwerp, with which it has also canal connexion. Industries include paper, playing-card, and cloth manufactures, lace-making, brewing, and tanning. The law courts occupy the remains of a castle built by the duchess of Guelders in the early 15th century. In 1648 the Spaniards were defeated near here by Maurice of Nassau. Pop. est. 29,000.

Turning. This process of cutting and shaping wood or metal is described under Lathe.

Turnip (*Brassica campestris*). Biennial herb of the family Cruciferae, native of Europe and N.



Turnip. Edible leaves and rootstocks of the white or garden variety

Asia; a common British weed. It is erect in habit, from 1 ft. to 2 ft. high, with bristly leaves, deeply cut in from the margins, and yellow flowers. Cultivated from ancient times, it has produced the valuable food plant of the same name, also the colza and the swede.

In the cultivated turnip the primary root and lower portion of the stem have become enlarged as a store for reserve material, and by selection and intercrossing this tendency has been increased until it has produced the juicy, white-fleshed garden turnip and the more solid-fleshed Rutabaga, or swede, used also as a winter cattle food.

The white turnip may be sown in drills, in succession, from mid-March to July or Aug., the drills being a foot apart and the young plants thinned out to a distance of 9 ins. The ground between the rows should be frequently hoed to keep it loose. Judicious thinning of the leaves will yield the table greens known as turnip tops.

The field turnip, or swede, is a great aid to the cattle farmer, supplying nutritious food for his stock in winter. As compared with the white turnip, it yields a higher percentage of solids, greater nutritive value, and is less liable to disease. The yellow flesh of the root is often tunnelled by the caterpillar of the turnip moth; and seedlings are ruined by the fungus *Plasmadiophora*, which produces the malformation finger and toe (*q.v.*).

Turnov (Ger Turnau). Town of Czecho-Slovakia, in Bohemia. It stands on the Iser, among the Lausitz Gebirge, 65 m. N.E. of

Prague. The chief industries are cutting diamonds and other precious stones, and making artificial gems.

Turnpike. Gate across a road to prevent the passage of vehicles or pedestrians until a toll is paid. A turnpike road was one upon which such gates were established by law, and which was kept in repair by the tolls paid. See Rebecca Riots; Roads; Toll.

Turnsole. Dye-stuff obtained by grinding a small Mediterranean plant, *Crotophora tinctoria*, of the family Euphorbiaceae. It is also an old name for the Sun Spurge (*Euphorbia helioscopia*) and the Heliotrope (*Heliotropium peruvianum*).

Turnspit. One who turned a spit or long rod or bar on which meat was roasted before the fire. Large spits were often turned by means of dogs, the animal being attached to the wheel that turned the spit on which hung the meat.

Turnstone (*Arenaria interpres*). Shore bird, belonging to the plover tribe. It is about 9 ins. long, and the plumage is black and white on the head and neck, black and chestnut on the back, and white on the underparts, the breast banded with greyish black. It arrives in Great Britain about the beginning of Aug. and remains about the S. and W.



Turnstone, a British shore bird which breeds in the Arctic regions

coasts all through the winter, leaving in May for the breeding grounds in the Arctic regions.

Turntable. Revolving platform by means of which wheeled vehicles may be turned so as to face in a different direction. Small turntables are made for road vehicles where turning space is limited, but the most general application is to railway vehicles. A locomotive turntable comprises a pair of girders carrying a railway track. The girders are suspended at their centre upon a steel cup and ball pivot resting on a pedestal in the middle of a circular pit and forming a fulcrum and centre round which the girders may be turned. This pivot supports the weight of the turntable and its load and sometimes rests upon a nest of steel balls or

conical rollers. The girder ends are fitted with wheels which just clear the circular rail laid round the inside of the pit.

When a locomotive passes on to the turntable one end is depressed, so that the wheels bear upon the rail, affording it temporary support; the locomotive then passes right on to the table until it is approximately balanced upon the centre pivot, when the whole turntable with the locomotive upon it can be revolved by two men pressing against levers or handles, as in the figure. An electric motor is sometimes substituted for hand power. By this means a locomotive may be turned so as to face in the opposite direction. See Locomotive.

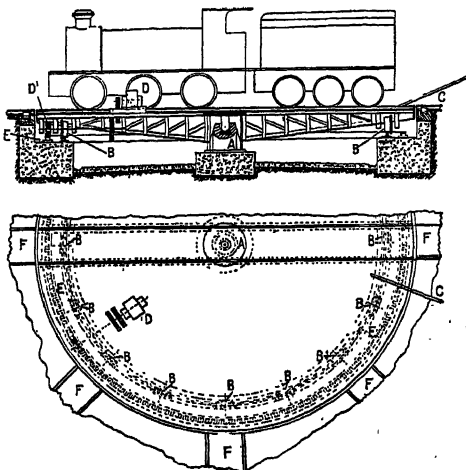
Turnus. In Roman legend, king of the Rutuli, an Italian tribe, and betrothed to Lavinia, daughter of Latinus, before the arrival of Aeneas. When Latinus promised his daughter to the latter, Turnus and his people took up arms and fought with the stranger, but he was killed outright in single combat with Aeneas. In the Aeneid, the genius of Virgil has invested Turnus with a personality which makes him a really heroic figure.

Turnu Severin. Town of Rumania. It is situated on the N. side of the Danube, at the E. end of the Iron Gates, about 60 m. N.W. of Craiova, with which it is connected by rly. In normal times it is a busy river port, with a trade in grain and petroleum. It has shipyards and repair shops for the river steamers. During the First Great War the town was captured by the Austrians, Nov. 24, 1916. In the Second Great War it fell to the Russians on Sept. 6, 1944, giving them control of the N. bank of the Danube opposite Bulgaria.

Turonian Deposits. In geology, a division of the Upper Cretaceous system of rocks. They are found typically in the French Alps and Pyrenees. See Cretaceous.

Turpentine. Oleo-resin which exudes from various species of Coniferae and from which oil or spirit of turpentine is obtained by

distillation. The term turpentine is, however, often applied to the distillate as well as the crude oleo-resin to which it more properly



Turntable. Sectional and plan diagrams illustrating construction and working parts. A. Central pivot. B B. Runners. C. Handle for turning by hand. D. Motor for rotating by power through pinion D¹ and pinion track E. F F. Railway track

belongs. European turpentine is obtained from *Pinus sylvestris* in Russia and Finland, *P. laricio* in Austria and Corsica, and *P. maritima* in France. American turpentine, which comes from the U.S.A., is the product of *P. australis*, the swamp pine, and *P. taeda*, the loblolly.

The crude turpentine is distilled with water in copper stills, the oil of turpentine passing over as vapour while the residue in the still is resin or colophony. The chief use of oil of turpentine is as a solvent for making varnishes and as a diluent of paint. Venice turpentine, a semi-solid substance, obtained from *P. larix* in Tirol, is used in varnishes and in lithography. Canada turpentine, also known as Canada balsam, is the produce of *Abies balsamea*, and finds application in medicine, in the preparation of collodion, and in microscopy.

Turpin or **TILPIN** (d. c. 800). Frankish prelate. Probably from a monastery at St. Denis, he was appointed archbishop of Reims in 753, and in 769 attended the council held under Pope Stephen II, which condemned the anti-pope Constantine. In a highly romanticised guise he appears in the Chanson de Roland, Renaut de Montauban, and other chansons de geste. The remarkable historical romance known as the Chronique de l'Archevêque Turpin was probably a composite production of the 12th century.

Turpin, RICHARD (1706-39). English highwayman. Born at Hempstead, Essex, the son of an innkeeper, he was apprenticed to a butcher. Detected in cattle-stealing, he joined a gang of robbers, who under his leadership plundered many lonely farms. In 1735 he is said to have entered into partnership with Tom King, the highwayman. Traced by the theft of a horse to Whitechapel, Dick Turpin there accidentally shot his companion, but escaped to York, where under the name of Palmer he became a horse-dealer. Romanticised in legend and fiction, he was in reality a conscienceless scoundrel, and was hanged for horse-stealing, April 7, 1739.

Turquoise (Fr., fem., Turkish). In mineralogy, a hydrated aluminium and copper phosphate. One of the precious stones, opaque, waxy in appearance, its colour varies from blue to green, the blue varieties being the most valuable. It is found in thin veins or patches in certain igneous rocks that have been profoundly altered. The finest turquoisees are Persian in origin, and their importation thence into Europe via Turkey is commemorated in the name. Mines in the U.S.A., Egypt, and Russia also yield valuable stones. See Precious Stones colour plate.

Turret (Lat. *turris*, tower). Small tower, usually built for decorative purposes, on a large building. Turrets were often erected at the angles of medieval buildings, or attached to large towers, as encasements for circular staircases. (See Tower.)

In a battleship (q.v.) the turret is a circular armoured structure on the deck in which the heavy guns are mounted. By hydraulic or electrical power the turret can be moved round as required. Its under-structure goes to the bottom of the ship where are the magazines, and the gun ammunition is sent up inside the turret.

Bombing aircraft are fitted with transparent turrets to carry their defensive armament. The turret is powered from the aircraft engine, and makes it possible for the gunner to swing his guns on to a target without being subject to the effects of air flow which otherwise would deflect his aim. A turret also makes it possible to use belt-fed ammunition, the weight of which would be impracticable in the open, or scarf-ring mounting. On bombers there is usually a turret in the nose, tail, and on the top of the fuselage. The largest turret-mounted gun on British

bombers is the 20-mm. cannon of the Lincoln bomber. The first fighter to carry a power-operated turret was the British Defiant. On some U.S. bombers the turrets are armoured and unmanned, the guns being fired by remote control from within the fuselage.

The main armament of tanks is mounted in a central armoured turret which can traverse a complete circle.

Turriff. Mun. and police burgh, of Aberdeenshire, Scotland. It is 11 m. S. of Banff on the rly. Still to be seen is the 16th century choir of a church once belonging to the Templars. The Trot of Turriff was the first skirmish of the Civil War, May 14, 1639. Pop. 2,300.

Turtle (*Chelone*). Name given to members of the tortoise group specialised for marine life. They

coriacea) has a series of longitudinal ridges on its carapace, and is sometimes over six feet long. It occurs in the tropics and is occasionally found in the British seas, but appears to be gradually becoming extinct. See Animal colour plate; Reptile; Tortoise.

Turtle Dove (*Streptopelia turtur*). Species of small migratory pigeon, which visits Great Britain in the summer. It has a reddish tinge on the head and neck, a black and white collar, rusty red wings with black spots, and a dusky tail. It is slightly under a foot in total length. It arrives in April, and is not uncommon in the S. and Midland counties of England, but is rather rare in the W. counties, Wales, and Ireland; and it does not appear to visit Scotland. It lives in the woods, where it

Turneydrop is one of the most satirical of Dickens's gallery of great grotesques.

Tuscaloosa. City of Alabama, U.S.A., the co. seat of Tuscaloosa co. It is 55 m. S.W. of Birmingham and is served by the Louisville and Nashville and other rlys. Coal-mining is carried on in the neighbourhood, and cotton and lumber products are manufactured. Alabama university is here, housed in fine old mansions dating from the prosperous era of cotton-growing in 1820-40. Tuscaloosa was settled in 1815, and received a city charter in 1819. It was the state capital 1826-46. Pop. 27,493.

Tuscan Order. In classic architecture, one of the orders used by the Romans. It was a modification of the Greek Doric with the mouldings bolder and fewer, and the triglyph (*q.v.*) omitted. See Rome: Art and Architecture.

Tuscany (Ital. Toscana). A region, and former grand duchy, of Italy. The region is situated in the W. central portion of the peninsula and bounded W. by the Mediterranean, N. by Liguria and Emilia, S. by Latium and Umbria, E. by the Marches. The Apennines traverse the E. parts, and on the Mediterranean coast is the wide Maremma (marshes), formerly an unhealthy waste, but now irrigated and pasture land. Rich in minerals, among which are iron, copper, salt, and marble, the country is also one of the most fertile in Italy, producing wheat, maize, olives, and wine. The principal river is the Arno (*q.v.*). Florence is the largest city, others being Pisa, Lucca, Leghorn, Siena, and Arezzo. From Florence are rly. connexions to all parts of Italy. With an area of 8,880 sq. m., and a pop. of 3,099,000, Tuscany consists of the provs. of Arezzo, Florence, Grosseto, Leghorn, Lucca, Massa-Carrara, Pisa, Pistoia, and Siena. Tuscany was long one of the centres of Italian art, and the Tuscan school of painting flourished from the 13th century, producing many famous artists.

On the fall of the Western empire Tuscany, which roughly corresponded to the ancient Etruria (*q.v.*), passed through the hands of many conquerors and was eventually granted by Charlemagne to the Frankish Boniface, whose descendants ruled until 1114, when the last representative of the family, Matilda, bequeathed her estates to the Church. The emperor disputed the will and, amid the confusion which followed, the chief Tuscan cities declared their inde-



Turtle. 1. Leatherhead turtle of tropical seas. 2. Hawksbill turtle, whose carapace supplies tortoiseshell. 3. Edible green species, famed for its use in making soup. 4. Snapping turtle, *Chelydra serpentina*, found in the E. Pacific from S. Canada to Ecuador

differ from land tortoises in having the feet modified into paddles; the carapace is usually heart-shaped and somewhat flattened; and the head can be only partly retracted. They spend all their time in the water except in the breeding season, when they visit the shores to deposit their eggs in the sand; but they have to rise to the surface at intervals to breathe. The most widely famed species is the green turtle (*C. mydas*), used in making soup. It is confined to tropical regions, and is distinguished by the smoothness of its shield-like carapace and the shortness of its beak.

The Hawksbill turtle (*Eretmochelys imbricata*) is in great demand as the chief source of the best grades of tortoiseshell. The Logger-head is a very large species, remarkable for the great head; it occurs in the Mediterranean, and occasionally off the E. shores of Europe. It feeds mainly on marine molluscs, the shells of which it cracks with its powerful jaws. The Leatherhead turtle (*Dermochelidae*

usually nests in low trees and hedges, and is extremely shy and wary. See Ground Pigeon.

Turton. Urban dist. and town of Lancashire, England. Containing four rly. stations, it is 4 m. N.



Turton arms

of Bolton. The principal industries are connected with cotton mills. Turton Tower, a castellated mansion in the town, dates from the early 12th century, and was rebuilt in 1596. Turton votes in the Darwen co. constituency. Pop. 10,720.

Turneydrop, Mr. Character in Dickens's novel Bleak House. He is a "Model of Deportment," who apes the style and appearance of the Prince Regent, whom he claims as a patron, while living in selfish idleness upon the meagre earnings of his son Prince (named after the Regent), a dancing master, just as during her lifetime he had lived upon those of his wife.

pendence and proclaimed themselves republics. These included Florence, Pisa, Pistoia, Lucca, and Siena. The rise of the great families was fatal to the republics of Italy; Florence became a principality under the authority of the Medici family, who in 1567 became grand dukes of Tuscany.

Successive generations of indolent and feeble rulers reduced the once flourishing country to a lifeless condition. After the extinction of the Medic line, 1737, the Powers granted Tuscany to Francis of Lorraine, afterwards emperor of Austria, who bequeathed it to his younger son, Leopold I. Under this enlightened monarch the country awoke and began to flourish. In 1790 Leopold ascended the imperial throne and the duchy fell to his son Ferdinand, who was driven out by the French nine years later. Napoleon made Tuscany the core of the kingdom of Etruria, but the fall of the emperor in 1814 enabled Murat to occupy the country and buy his own peace with the Powers by handing it to Austria. Ferdinand was reinstated by the congress of Vienna. His son, Leopold II, who succeeded him in 1824, granted a constitution which he abrogated as soon as he could, and in 1859 he was finally expelled by the popular movement. The provisional government then formed, after overcoming various difficulties, handed over the duchy to Victor Emmanuel, to be incorporated in 1860 in the kingdom of Italy. Tuscany suffered serious devastation during the Second Great War. See Florence; Italy; Painting; Italy, Campaigns in, 1943-45.

Tusculum. Ancient city of Latium. It is situated among the Alban Hills, 15 m. S.E. of Rome. Probably an older foundation than Rome itself, the city became an ally in 497 B.C. Near the end of the Roman period Tusculum was a municipium and a favourite country residence of wealthy Roman citizens. In 1191 the ancient city was razed by the Romans. An amphitheatre, theatre, and city walls have been excavated in modern times. See Frascati.

Tusitala. Name by which R. L. Stevenson (*q.v.*) was known to the natives of Samoa. The word signifies "teller of tales," and was first given to the novelist by the missionary J. E. Newell at Malua in 1889. The words "the tomb of Tusitala" are inscribed in Samoan on Stevenson's tomb.

Tusk. Name given to certain teeth of beasts, developed enor-

mously in excess of the others in a set. These are always either incisors or canine teeth, and they may be in the upper or lower jaw in different species. Perhaps the most remarkable is the single tusk of the narwhal, which stands straight in front of the upper jaw to a length of ten feet and has a pulp cavity almost throughout; externally it appears as though spirally twisted. The stout, slightly curved tusks of the elephant represent a pair of incisors in the upper jaw, as did those of the extinct mammoth and mastodon.

The dinotherium, on the other hand, had a pair of downward, backward-curving tusks from its lower jaw. In the existing Atlantic walrus are a somewhat similar pair of tusks, but they are in the upper jaw, and represent canines. In the pig tribe the lower canines of the wild boar develop into curved tusks far too large to be covered by the upper lip. The lower canines of the hippopotamus develop into enormous tusks with chisel edges. See Africa; Ivory; Narwhal; Teeth.

Tussac OR **TUSOCK GRASS** (*Aira caespitosa*). Perennial grass of the family Gramineae. It is a native of the temperate, Arctic, and mountain regions. It has stout, smooth leafy stems, three or four feet in height, the leaves leathery. The flower cluster is plume-like, many-branched, bearing shining purplish spikelets. The celebrated tussock grass of the Falkland Islands is *Dactylis caespitosa*, allied to the European cock's-foot grass (*D. glomerata*).

Tussaud, Marie (1760-1850). Swiss wax modeller. Born at Berne, daughter of an officer, Joseph Gros-



Marie Tussaud,
Swiss wax modeller
From a waxwork

holtz, she was taught modelling by her uncle, J. C. Curtius, who established in 1780 a wax cabinet in the Palais Royal, Paris, and they modelled the heads of many victims of the guillotine in the Revolution. She married in 1794, and in 1802 transferred the waxwork museum, with its many relics, to London, establishing it first at the Lyceum, then at Blackheath, and in 1833 in Baker Street, whence in 1884 it was transferred to Marylebone Road. Madame Tussaud died April 16, 1850.

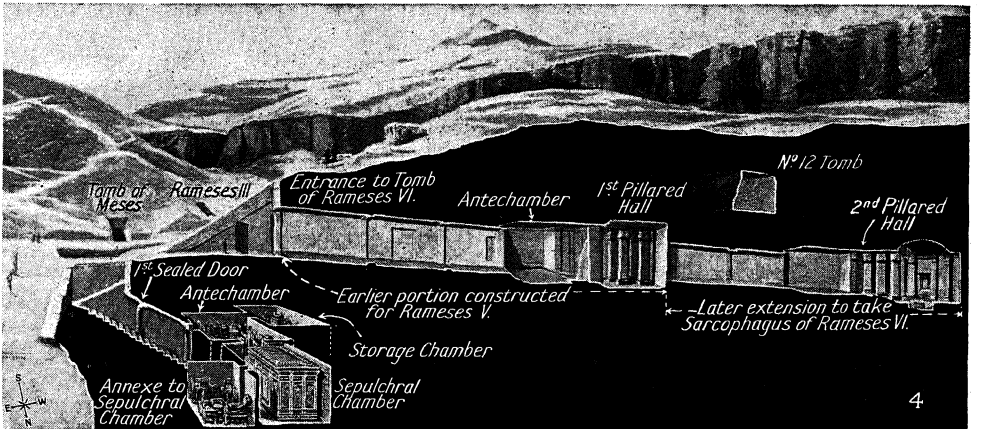
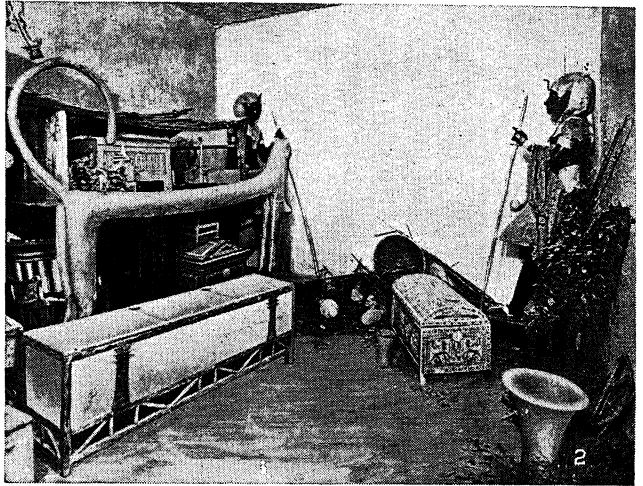
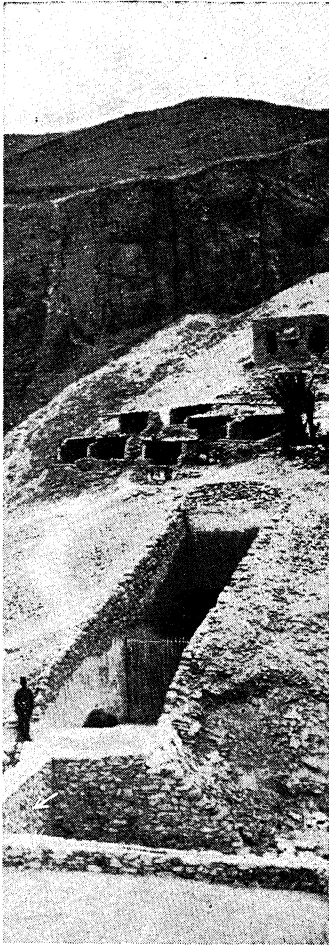
On March 18, 1925, Madame Tussaud's was burned down. It

was rebuilt on the same site on a much larger scale, the block including a cinema and a restaurant, and opened 1928. On Sept. 8, 1940, the cinema was damaged by a German bomb. Perhaps the most popular features of the exhibition are effigies of all the sovereigns of England, and the "chamber of horrors." See Coach; Effigy; Waxworks. Consult Romance of Madame Tussaud's, L. Tussaud, 1937. *Pron.* Too-so.

Tussore, Tussur, or Tussah (Hind. *tassar*, shuttle). Silk produced chiefly by the larvae of two species of moth of the genus *Antheraea*. Tussore silk has a strong, coarse filament, flat in section, and is washable. Though called a wild silk, it is generally cultivated. See Shantung; Silk.

Tutankhamen. Egyptian king of the XVIIIth dynasty. Though little is known of his life, the reign (1358-53 B.C.) of this pharaoh has considerable historical importance. He was a mere youth when, after an interregnum of a few weeks, he succeeded Akhnaton (*q.v.*), the so-called heretic pharaoh, who sought to establish the monotheistic cult of Aton, symbolised in the disk of the sun, in place of that of Amen or Ammon (*q.v.*). Akhnaton had to move his capital from Thebes to Tell el-Amarna owing to the opposition of the priests of Ammon. Tutankhaton, his son-in-law, was believed also to be a convert to the cult of Aton, but after becoming pharaoh returned to Thebes (1355 B.C.) and formally restored the old religion, changing his name from Tutankhaton (image of Aton) to Tutankhamen (image of Amen). He was buried in the Valley of the Kings at Thebes.

Despite the ancient plundering of the tombs of the kings, systematic excavations in this valley, begun early in the 19th century, revealed an astonishing collection of treasures, and it was thought nothing more of moment remained to be unearthed. But in 1906 the 5th earl of Carnarvon (*q.v.*) began archaeological researches which in cooperation with Howard Carter (*q.v.*), he patiently and systematically pursued for 16 years. It fell to Carter, while Carnarvon was absent in England, to discover, in almost the last piece of unsifted ground, the entrance to the tomb of Tutankhamen, Nov. 5, 1922. The two excavators removed the seals which had been affixed by the inspectors of Rameses IX in the 12th century B.C. and entered the tomb. On Feb. 16, 1923, they opened the sepulchral chamber, afterwards



1. Site of Tutankhamen's tomb, the spot marked by an arrow indicating where entrance was discovered. 2. Ante-chamber, with sealed doorway leading to the inner chamber. 3. Doorway pierced by the excavators,

revealing the outermost canopy of the first shrine of sepulchral chamber. 4. Diagram showing position of the tomb, with its corridors and chambers, deep-cut in the rock, compared with that of Ramses VI.

TUTANKHAMEN: THE TOMB OF THE PHARAOH AND ITS MARVELLOUS CONTENTS

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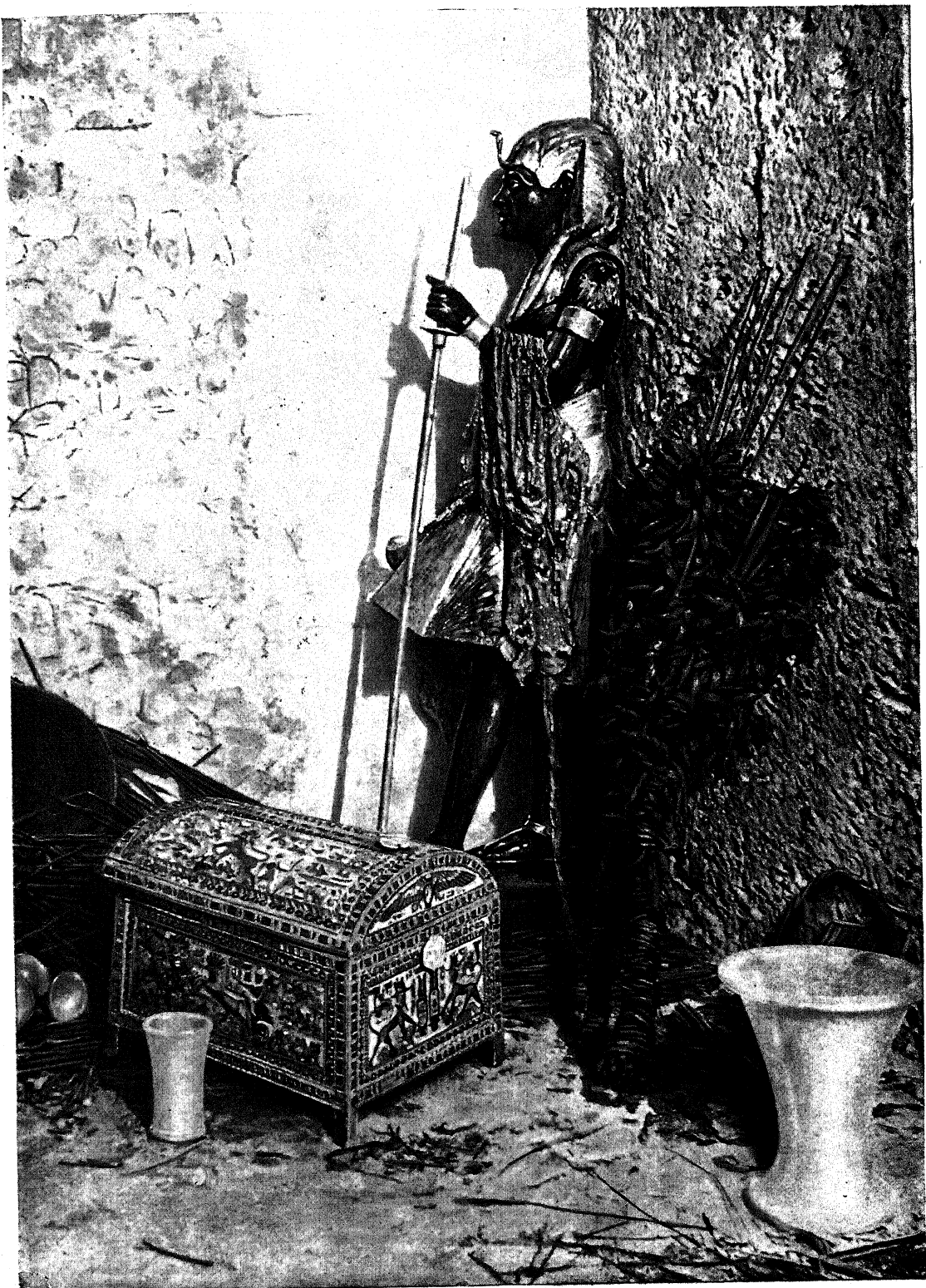


Among the marvellous discoveries made when the tomb of Tutankhamen was opened in 1923 were these vases of alabaster, exquisite in taste and craftsmanship, which

were grouped in a corner of the ante-chamber of the tomb. The faint fragrance of the perfumed essences they once contained was still perceptible after 3,300 years

TUTANKHAMEN: MATCHLESS ALABASTER VASES FOUND WITHIN HIS TOMB

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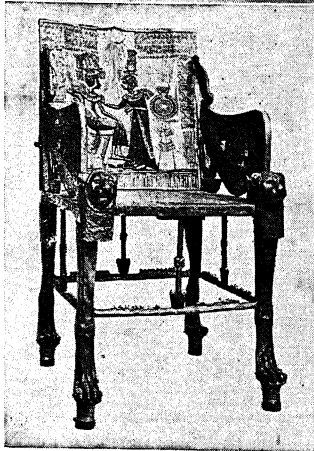
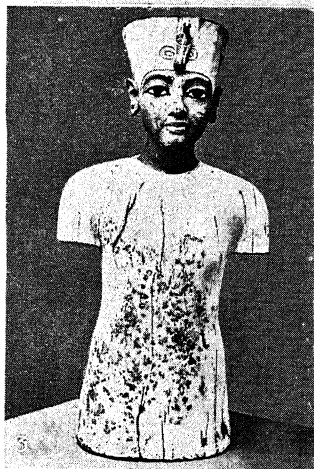
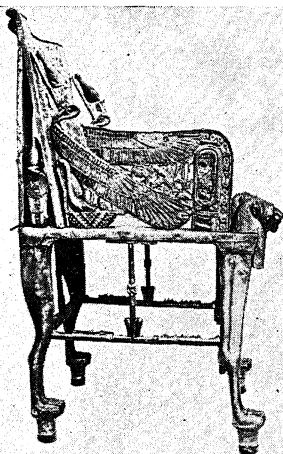


The statue of Tutankhamen seen here was one of two which stood outside the sealed entrance to the sepulchral chamber. Seven feet high, they were carved from wood, later bituminised, and gorgeously decorated with beaten

gold. The painting on the clothes chest, also seen here, exceeds in delicacy of brushwork and charm of design even the famed work of the Chinese and Japanese. Other views are given in Figs. 2 and 3 in the plate facing p. 8232

TUTANKHAMEN: GLOWING COLOURS THIRTY-THREE CENTURIES OLD

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1. Side view of Tutankhamen's coronation throne. 2. The throne overlaid with sheet gold. Its arms are formed of crowned and winged serpents supporting the king's cartouches. The back panel depicts the king and queen in the palace. 3. Life-size wooden model of Tutankhamen, thought to be a portrait of the young king.

4. Showing in detail the superb panel of the throne. The picture is of intaid polychrome glass, faience, and stones. 5. Oval boxes containing mummified food for the dead king are seen under the gilt-and-blue ceremonial couch, the sides of which are Hathor cows; the royal bedstead, a papyrus chair, and various other objects are also shown

TUTANKHAMEN: FUNERARY OBJECTS THAT WERE REVEALED AFTER 33 CENTURIES

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superintending removal of the funerary furniture and art treasures. Among the immense number of things thus brought to light were gorgeous golden beds and couches of state, chariots, caskets, candlesticks, the actual garlands of flowers placed with the dead, nearly all in splendid preservation. Regarded as the gem of the whole collection was the throne, encrusted with gold and silver and sparkling with jewels. Carnarvon died on April 5 from the effects of a mosquito bite while the work of clearing the tomb was in progress; but his colleague on Jan. 3, 1924, reached the sarcophagus of Tutankhamen, the lid of which was opened on Feb. 12. See Egypt; Tell el-Amarna.

Tutbury. A town of Staffs, England. It stands on the Dove, 4 m. N.N.W. of Burton-upon-Trent, and has a rly. station. The chief building is S. Mary's church, which contains Norman work of the 12th century when it was part of a Benedictine house founded 1081. The Norman castle, one of the prisons of Mary Queen of Scots, was destroyed in 1647. Tutbury produces plaster, gypsum, and fine cut glass. Pop. 2,000.

Tuthillite. Non-nitroglycerine permitted explosive in which the sensitiser is TNT (13-15 p.c.) mixed with ammonium nitrate (65.5-68.5 p.c.) to compensate for its lack of oxygen. Tuthillite is used for coal getting, or in dry pits as a general purpose explosive.

Tuticorin or **TUTTUKUDI.** Seaport of India, in the S. of Madras state, in the Tinnevely district, 443 m. S. by W. of Madras on the South Indian rly., and 149 m. from Colombo by sea. It was founded as a settlement by the Portuguese in 1540, captured by the Dutch in 1658 and by the British in 1782, restored and retaken several times, and came into British hands in 1825. The harbour is so shallow that steamers anchor 5 m. from the shore, but Hare Island affords protection to lighters and other craft. Next to Madras and Cochin, Tuticorin has the largest trade in S. India. It exports pulses, onions, chillies, livestock, cotton, Palmyra fibre, and cardamoms. Pop. 86,775.

Tuttle's Comet. Comet first seen in 1790 and shown to be periodic by C. W. Tuttle (1829-81) in 1858. It has a period of nearly 14 years.

Tutor (Lat., guardian, from *tueri*, to watch over). In Roman law, the guardian of an infant not under *patria potestas* (q.v.), and originally of a woman of any age,

not otherwise protected. The tutor was appointed by the testament of the father or husband, generally from among the nearest kindred, and could not refuse the duty without valid excuse. He represented his ward (*pupillus*) at law, administered his property, and provided for his education and maintenance.

At English universities, college tutors are fellows whose primary duty it is to advise the undergraduates assigned to their care, and to supervise their studies. At American universities they are junior members of the teaching staff. The word tutor is also applied to a private male teacher, especially to one resident in the house, and charged with the education of a boy or girl. In Scots law a tutor is a guardian of a boy under 14, or a girl under 12.

Tuva. Region of the R.S.F.S.R. It is bounded on the E., W., and N. by Siberia and on the S. by Outer Mongolia. Formerly ruled by hereditary tribal chiefs, it was incorporated in the R.S.F.S.R. in 1944, as the Tannu-Tuva republic, and became the Tuva region the following year. The Tuvians are a Turki people, whose chief occupation is cattle-raising, though the region has gold and asbestos deposits. The capital is Kysylchoto (in Russian Krasny) formerly called Khem-Beldir. The area of Tuva is 64,000 sq. m.; pop. 65,000.

Tuxtla or **TUXTLA** **GUTIERREZ.** Town of Mexico, capital of the state of Chiapas. Situated 265 m. S.E. of Vera Cruz, it has tanning and indigo industries; mining and fruit growing are carried on in the neighbourhood. Pop. 15,883.

Túy (anc. Tudae). Town of Spain, in the prov. of Pontevedra. Situated 25 m. by rly. S. of Vigo, it is a frontier town on the Miño opposite Valença do Minho in Portugal, the towns being joined by an international iron bridge. The massive 12th century cathedral resembles a fortress. Fruit, vegetables, and silkworms are products of the fertile surrounding Vega del Oro. Alfonso III recaptured the town from the Moors in the 12th century. Pop. 13,500.

Tuyere (Fr., nozzle). In metallurgy, nozzle of a tube used to blow large volumes of hot or cold air into a furnace. This is done

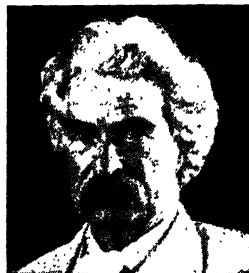
either to oxidise some constituent of the charge and remove it as a gas or slag or to burn a fuel, mixed with the charge, to provide heat for smelting. Examples are the blast furnace, in which the charge is mixed with coke, and air is blown in at the bottom to burn it, and the converter, in which air is blown in beneath the surface of the molten matte, in copper smelting, or iron, in the manufacture of steel by the Bessemer process. In such processes the air must be introduced through a nozzle and its design is of great importance. The orifice is sometimes surrounded by a hollow steel wall, through which cooling water may be passed, but the tuyere hole is often made of refractory brickwork. Wear at the tuyere, due to the passage of large amounts of air, causes continual maintenance work and very often determines the ultimate life of the furnace. *Prox. twee-air.* See Bessemer Process; Converter; Copper; Metallurgy; Steel.

Tuz Tcholu or **TUZ GOL.** Salt lake of Asia Minor, the ancient Palus Tattaeta. Lying N.E. of Konieh, it has an area of about 700 sq. m., its length being 45 m. and its greatest width about 16 m.

Tvastri or **TVASHTRI.** In Hindu mythology, the god who shaped all things at his forge, the maker of Indra's thunderbolts, and the sharpener of the axe of Brahmanaspati. He is looked upon as the guardian deity of all craftsmen.

Tver. The region and city of R.S.F.S.R. formerly called Tver are in this work described under their new name of Kalinin, from Pres. Mikhail Kalinin.

Twain, MARK (1835-1910). Pen-name of Samuel Langhorne Clemens, American humorous author. Born at Florida, Missouri, Nov. 30, 1835, he claimed descent on his mother's side from the Lambtons of Durham, England, and on his father's side from men who, in Elizabeth's time, were pirates and slavers. His first job was in a printing works. In 1851 he became a steamboat pilot on the Mississippi, later taking his pen-name from the call of the leadsmen when reporting the soundings. After being a reporter on a newspaper in Virginia City, Nevada, he tried mining and journalism in San Francisco, and visited the Sandwich Islands.



Mark Twain

His first story, *The Celebrated Jumping Frog of Calaveras County*, appeared in *The Californian*, 1867. His first book, *Innocents Abroad*, 1869, the result of his first visit to Europe, established his reputation as a humorist. During 1869-71 he edited *The Buffalo Express*. Roughing It, 1872, based on his experiences in the Far West, was followed by *The Gilded Age*, 1873, written with C. D. Warner and later dramatised.

Then came *The Adventures of Tom Sawyer*, 1876, describing the lawless side of boyhood; *Life on the Mississippi*, 1883, full of vivid narrative; and *Huckleberry Finn*, 1885, a companion story to *Tom Sawyer*. Meanwhile, a second trip to Europe had produced *A Tramp Abroad*, 1880, and in 1882 appeared a juvenile romance, *The Prince and the Pauper*.

In 1884 Mark Twain became a partner in the publishing house of Charles L. Webster & Co., whose failure in 1894 involved him in liabilities which a five years' lecturing tour round the world enabled him fully to liquidate. Of his other works the most notable are *A Connecticut Yankee at the Court of King Arthur*, 1889, a rather bitter burlesque on the *Morte d'Arthur*, which was much later filmed with Will Rogers in the title rôle; *Personal Recollections of Joan of Arc*, 1896; *Following the Equator (or More Tramps Abroad)*, 1897; *How to Tell a Story*, 1897; an unfinished autobiography which ran serially in *The North American Review*, 1906-08; and an excursion into the Shakespeare-Bacon controversy, *Is Shakespeare Dead?*, 1909. In 1907 Oxford university conferred upon him the honorary degree of D.Litt. He died at Redding, Connecticut, April 21, 1910, two days after the appearance of Halley's comet, which had last appeared on the day of Twain's birth. His wife, Olivia L. Langdon, had died in 1904.

Mark Twain's humour depended on his acute sense of the incongruous, but under much of it was the pungent satire of a somewhat iconoclastic reformer. He loved a practical joke, but he hated shams. He never lost his hold on his public, and none of his contemporaries wielded a more dramatic pen or had a keener sense of nature in her various moods. Fredric March played Mark Twain in a film based on his life, 1944.

Bibliography. Works, 25 vols., 1910; Speeches, ed. W. D. Howells, 1910; *My Mark Twain*, W. D. Howells, 1910; *Biographical Studies*, H. Sedgwick, 1908; T. A.

Henderson, 1911; A. B. Paine, 1912; *My Father*, C. Clemens, 1931; Mark Twain, S. Leacock, 1932; *The Ordeal of Mark Twain*, V. W. Brooks, 1934.

Twayblade (*Listera ovata*). Perennial herb of the family Orchidaceae, native of Europe and Siberia. It has fleshy roots without tubers and two large, broadly elliptic leaves. The stem ends in a very long spray of small yellow-green flowers with a long, narrow lip ending in two lobes. A smaller species is known as the lesser twayblade (*L. cordata*).

Tweed. Soft, flexible, twilled woollen fabric. It is often made in two or more colours, the yarn being dyed before weaving. Tweed was first made of the famous Cheviot wool in the district along the river Tweed, in Scotland; Hawick, Gala-

from 1649 to his death, Aug. 11, 1697. He was made a marquess in 1694. His son John, the 2nd marquess (1645-1713), was lord chancellor of Scotland, and John, the 4th marquess (d. 1762), was secretary of state for Scotland. In 1787, on the failure of nearer heirs, George (1733-1804), a descendant of the 2nd marquess, succeeded to the title. His son George, the 8th marquess (1787-1876), was a soldier of distinction, and from him is descended the 11th marquess, William (b. Nov. 4, 1884). The marquess sits in the house of lords as Baron Tweeddale, a title dating from 1881. His seat is Yester House, and an eldest son is known as earl of Gifford.

Tweedmouth. Town and seaport of Northumberland, England. It stands on the right or S. bank of the Tweed, opposite Berwick.



Tweedmouth, Northumberland. Bridge over the Tweed, looking towards Berwick

shields, Innerleithen, and Selkirk being the original tweed-making towns. The industry spread to Aberdeen, Ayr, Glasgow, and Paisley. Harris tweed is made in the Hebrides. See Weaving.

Tweed. River of Scotland and England. It rises in the hills of Peeblesshire, and flows across that county, Selkirkshire, and Roxburghshire. Beyond Kelso it forms the boundary between Berwickshire and Northumberland, and it continues to do so until within 2 m. of its mouth at Berwick. Its length is 97 m. Its chief tributaries are the Ettrick, Gala, Eden Water, Till, and Teviot. The Tweed is noted for salmon and trout fishing. See Kelso; Roxburgh; Seine Net. Consult *The Story of the Tweed*, Sir H. Maxwell, 1905.

Tweeddale. Former name of the Scottish co. Peeblesshire (q.v.).

Tweeddale, MARQUESS OF. Scottish title held since 1694 by the family of Hay. John Hay of Yester in E. Lothian was made a lord of parliament in 1478. From William (d. 1596), a later lord, who fought for Mary Queen of Scots, the title passed to John, made earl of Tweeddale in 1646. His son John, the 2nd earl, was a prominent politician, though not a consistent one,

It has a little shipping; other industries are fishing and engineering. On the parish church spire a salmon serves as weathercock. Tweedmouth is within the liberties of Berwick, with which it is connected by a fine stone bridge, finished in 1634, and a four-span ferro-concrete bridge, opened 1928. Pop. 5,574. See illus. p. 1117.

Tweedmouth, EDWARD MARJORIBANKS, 2ND BARON (1849-1909). British politician. Born July 5, 1849, he was the son of Dudley Marjoribanks, M.P. (1820-94), whose barony was conferred in 1881. Educated at Harrow and Christ Church, Oxford, Edward entered the house of commons in 1880 as Liberal M.P. for Berwick, and remained there until he succeeded to the peerage in 1894. In 1886 he was comptroller of the household; in 1892 parliamentary secretary to the Treasury; and in 1894-95 lord privy seal and chancellor of the duchy. From 1905 he was first lord of the Admiralty, but a letter he wrote to the German emperor in March, 1908, aroused some criticism, and, after *The Times* had made the fact known, he was transferred to the office of lord president. Tweedmouth died Sept. 15, 1909, his son,

Dudley Churchill (1874–1935), becoming the 3rd and last baron.

Tweedsmuir, JOHN BUCHAN, 1st BARON (1875–1940). British writer, politician, and administrator.



Lord Tweedsmuir
(John Buchan)

He was born at Perth, Aug. 26, 1875, the son of a clergyman, and educated at Glasgow university and Brasenose, Oxford. At Oxford, where he had a highly successful academic career, he won the Newdigate prize and was president of the union. While still there he published his first books, *John Burnet of Barns*, 1898, and *A Lost Lady of Old Years*, 1899, swashbuckling historical romances of old Scotland, somewhat in the tradition of Stevenson. Called to the bar in 1901, he was in S. Africa during 1901–03 as secretary to Milner, an experience reflected in *Prester John*, 1910, and other novels. In 1915 he published what was to become his greatest popular success, *The Thirty-Nine Steps*, a spy story to which *Greenmantle*, 1916, and *Mr. Standfast*, 1919, were sequels that successfully recaptured the atmosphere of the first volume (see Hannay, Richard). Meanwhile Buchan had spent some time at British h.q. in France in charge of news services, but was soon transferred to England, as director of information under Lloyd George. He also wrote a 24-vol. war history.

After the First Great War Buchan produced many novels and biographies, the most notable of the latter being *Sir Walter Scott*, 1932, and *Oliver Cromwell*, 1934. Conservative M.P. for the Scottish universities during 1927–35, he was lord high commissioner to the Church of Scotland in 1933 and 1934, and in 1936, having been raised to the peerage, went to Canada as governor-general. He continued to write, his *Augustus*, 1937, attracting wide attention, and published a volume of reminiscences, *Memory Hold-the-Door*, in 1940. He died Feb. 11, 1940. A volume of personal appreciations, *John Buchan*, by his wife and friends, appeared in 1947. His title passed to his son John Norman Stuart Buchan (b. Nov. 25, 1911), who was well-known as an ornithologist.

John Rowland

Twelfth Day. Day of the feast of the Epiphany, also called Old Christmas Day. The night of Jan. 6, Twelfth Night, was formerly a time of merry-making. In the Middle Ages men representing the Three Kings or Magi used to take part in a ceremony in church on this day. Under the Stuart kings masques were performed on Twelfth Night at court and elsewhere. See Epiphany; Wassail.

Twelfth Night, OR WHAT YOU WILL. A romantic comedy by Shakespeare, who designed it perhaps for a performance at court on Twelfth Night, 1600. Set in an idealised Illyria, it has an Italian origin and is partly borrowed from the tale of Apollonius and Silla in Riche's *Farewell to Militarie Profession*. The main plot is complicated by episodes of mistaken identity and concerns the loves of Duke Orsino, Countess Olivia, and foreign twins, Sebastian and Viola, who have been separately rescued from shipwreck. A sub-plot shows the discomfiture of Olivia's killjoy steward Malvolio by Sir Toby Belch (a lesser Falstaff) and his rowdy cronies. With its passages of exquisite poetry in the dialogues between Orsino and Viola; some of Shakespeare's loveliest songs, rendered by the jester Feste; and comedy ranging from broad buffoonery to fine irony, *Twelfth Night* has always been a favourite play. The comic scenes dominate to the extent that there are 1,741 lines of prose and only 763 of blank verse in a total of 2,684 lines. A famous revival was that at the Savoy Theatre, 1912, in which Henry Ainley played Malvolio; another, with black-and-white decor, was at the New Theatre, 1932. Also outstanding in Malvolio's part were Tree and Donald Wolfitt; as Viola, Lily Brayton, Phyllis Neilson-Terry, Jean Forbes-Robertson, and Margaretta Scott excelled; Ion Swinley brought Orsino to life; and Robert Atkins enjoyed Sir Toby.

Twelve Patriarchs, TESTAMENTS OF THE. One of the non-canonical O.T. Apocrypha or Pseud-epigrapha (i.e. works written under an assumed name). The work consists of twelve pamphlets which purport to give the last utterances of the twelve sons of Jacob. Written originally in Hebrew by a Pharisee, probably between 109 and 106 B.C., it suffered interpolation later at the hands of a Christian writer.

Twelve Tables, THE. Oldest code of Roman law, according to tradition promulgated in 451 and 450 B.C. by a commission of ten

Decemviri (*q.v.*). The code, of which fragments are extant, was written in archaic Latin on copper tablets set up in the forum of Rome. It was in the main a summary recapitulation, under 12 heads, of the old criminal and civil law, but contained no constitutional enactments. The tables, venerated by the later Romans, are believed by some scholars to be a private compilation, perhaps of the 3rd century B.C. See Roman Law.

Twenty-Four Hour Clock.

Method of computing time on the sidereal period of 24 hrs., ignoring a.m. and p.m. The hours begin with zero at midnight and progress to 23; 23.59 being one min. before midnight. Thus, 1.30 p.m. is called 13.30 hrs. The system is widely used on the Continent for rly. time-tables, and in Sweden for broadcasting. It is also the international method of computing time at observatories, and is used by the armies, navies, and air forces of most countries, including the U.K.

On April 22, 1934, the B.B.C. began, with govt. approval, experimental broadcasting of programmes timed according to the 24-hr. clock. There was little public support for the innovation, which ceased to apply on Aug. 19. A 24-hr. clock obviates misunderstanding of printed time-tables and other public announcements, printed or broadcast. Ordinary clocks can readily be adapted by having the numerals 13 to 24 placed next to the existing 1 to 12. In countries where the 24-hr. clock is used on the rlys., etc., the 12-hr. clock remains in general use otherwise, and a certain amount of mental arithmetic is involved in translating times after noon from the one system to the other.

Twenty-four Parganas. District of W. Bengal, India. Pargana is a word for sub-district. In the Gangetic delta S. of Calcutta and E. of the Hooghli, and including much of the Sundarbans (*q.v.*), the dist. covers 3,696 sq. m., is administered from Alipore, and has a pop. of 3,536,386. Rights over the territory were granted in 1757 to the E. India co., and in 1759 personally to Clive, on whose death they reverted to the co. Until the partition of 1947 the dist. was in the Presidency div. of Bengal prov.

Twerton-on-Avon. Suburb on the W. of Bath, Somerset, England. It is 108 m. by rly. W. of London. Twerton was one of the first places in England famous for its woollen and weaving industries, and is still notable for cloth mills. It had an annual fair in the 13th century,

and weaving was begun here by monks in the 14th century. The ancient church, restored, has a Norman doorway. Fielding was living at Twerton when he wrote part of *Tom Jones*.

Twickenham. Mun. bor. of Middlesex, England. A favourite residential district of Greater London, and a popular Thames-side resort, it is 11½ m. S.W. of Waterloo by rly., and includes Hampton, Teddington, and Whitton. The parish church of S. Mary, rebuilt early in the 18th century, and several times restored, has a tower said to have been built by William of Wykeham. Alexander Pope (*q.v.*), who was buried here, is commemorated by a modern house on the site of his villa.

Other famous residents were Horace Walpole, at Strawberry Hill; Queen Anne, born at York House; Kitty Clive, Grattan, Mrs. Fitzherbert, Lady Mary Wortley Montagu, Fielding, Tennyson, and several members of the Orleans family. Twickenham Park has been built over, but Marble Hill Park remains to preserve the view from Richmond Hill. Twickenham Eyot, nearly opposite York House, is popularly known as Eel Pie Island. The manor once belonged to the Brethren of the Holy Trinity, Hounslow, and the monks of Christ Church, Canterbury. At Twickenham is the ground of the Rugby Union, where international matches are played. Pop. est. 108,000. *Consult* Memorials of Twickenham, R. S. Cobbett, 1872.

Twilight. Diffused illumination after the setting of the sun and before its rising. The phenomenon is due to the reflection of light from upper layers of the atmosphere, which are still lit after sunset at the earth's surface. The intensity of the reflected light falls off as the sun sinks farther below the horizon, since the direct light then reaches only the higher and more diffuse layers of the atmosphere. Two periods of twilight are recognized, astronomical and civil; the former is limited by a solar depression of 18°, and the latter by the insufficiency of light for outdoor work. In the tropics civil twilight is brief, half an hour to an hour, whereas above lat. 48° at the summer solstice, twilight lasts all night, and for many nights in succession as the pole is approached.

Twilight Arch. Strictly the boundary, seen towards the end of civil twilight, between the illuminated segment extending along the W. horizon and the dark sky above. Several other twilight arches are

recognized, however, *e.g.* the earlier western one which may be visible even before sunset, separating the tinted segment from the blue sky, and the boundary of the earth's shadow, just after sunset, which has been termed the first eastern twilight arch. Occasionally the early western arch persists through the development of purple light (*q.v.*).

Twilight of the Gods. Usual English translation of the German *Götterdämmerung* (*q.v.*).

Twilight Sleep. Name given to a method of relieving or preventing the pains of childbirth by the administration of scopolamine-morphine. It demands continuous skilled medical observation. The method is less used with advances in anaesthesia and pain-relieving drugs.

Twill. Cloth with a surface of parallel diagonal lines or ribs. The effect is produced by passing the weft threads over one and under two or more warp threads instead of over one and under the next as in plain weaving. In fancy twills the regularity of the lines is broken.

Twin. One of two young produced at a birth. Twin births occur on an average once in 83 pregnancies, but the proportion varies in different races, being about one in 60 in Ireland, and one in 110 in England. Triplets occur about once in 10,000 pregnancies. Individual women sometimes show a tendency to twin pregnancies, and hereditary factors also play a part. Identical twins are produced by the splitting of one fertilised ovum. *See* Pregnancy; Siamese Twins.

Twinkling. Rapid variation in brightness, apparent position, and sometimes colour, of the stars. It is due to irregularities in the earth's atmosphere. *See* Scintillation.

Two Gentlemen of Verona. *THE* Comedy by Shakespeare. It is a story of two pairs of lovers, Proteus and Julia, and Valentine and Silvia; the element of fun being introduced particularly in the characters of Launce and his dog Crab. Written about 1591, and first printed in the 1623 folio, it was based to some extent on *The Story of the Shepherdess Filisena*, in Jorge de Montemayor's romance, *La Diana Enamorada*, of which an English version appeared in 1598. It contains 2,060 lines, including 1,509 blank verse and 408 prose. Apart from the song, *Who is Silvia?*, the play is not popularly known. A notable revival was at Daly's Theatre in 1895, with Ada Rehan as Julia and Maxine Elliott as Silvia.

Two Hundred Families. Term sometimes used for the group of families (*Les Deux Cents*) which for many years controlled finance in France. With few exceptions they were families already in good financial standing at the beginning of the 19th cent. The centre of their power was the Bank of France, founded by Napoleon I in 1806, over which they exercised complete control by their predominance among the 18 regents which governed it. The Mallet family, for instance, was represented among the regents for more than a century. Baron Edouard de Rothschild, the Marquis de Vogüé, president of the Société des Agriculteurs de France, and François de Wendel (steel manufacturer, president of the Comité des Forges, senator, and owner of the Journal des Débats) were other regents in the 1930s. By their control of other banks and of corporations, rly. cos., chemical and metallurgical concerns, etc., the 200 spread their influence throughout French industry, commerce, and agriculture; and by the ramifications of their interests in foreign finance and industry they contributed to the weakness of France when faced with German aggression. By the pressure the Bank could exert, through *e.g.* refusing credits needed by the treasury, it was able to make and break cabinets.

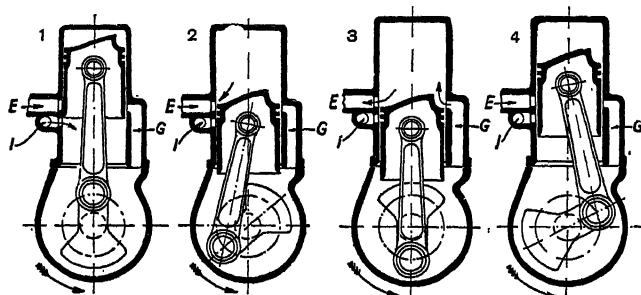
Twopenny Tube. Popular name once given to the former Central London rly., London's second tube rly., which, when opened in 1900, ran from the Bank to Shepherd's Bush, the fare for that distance or for any intermediate stages being fixed at twopence. The fixed fare was abandoned after the amalgamation of the rly. with other tube rlys., opened in 1907, to form the London Electric Rly. Extended (by 1949) eastward to Hainault and Epping, westward to West Ruislip, the former "twopenny tube," still known as the Central line, is now administered by British Railways (London Transport executive).

Two-Step. American dance. A modified polka, adapted to American rag-time music, it was introduced into Europe at the end of the 19th century. There are many variants, such as the Boston two-step and the Military two-step; the step is also included in the Brazilian maxixe.

Two-stroke Engine. Engine with no mechanically operated valves. The piston serves as exhaust valve and also as admission valve for the fresh charge. The

action of this type is shown in diagrams, where E is the exhaust pipe communicating with ports on the left side of the cylinder, and G communicates with ports on the right side for supplying the explosive mixture, or, in oil engines, the charge of air, to the cylinder. During the working stroke these ports are sealed by the piston (Fig. 1), which first uncovers the exhaust ports near the end of the stroke (Fig. 2), allowing the pressure in the cylinder to drop nearly to atmospheric. Shortly afterwards it also uncovers the admission port (Fig. 3), allowing the fresh charge, which has previously been compressed to a pressure just above atmospheric, to enter the cylinder and drive out as much as possible of the exhaust gases. This is the most difficult part of the cycle, and the piston is shaped so that as little mixture as possible of the gases occurs, since the power attainable depends upon the weight of fresh charge in the cylinder when the compression stroke commences (Fig. 4).

The air (or mixture of gas and air) is drawn into the crankcase on the upstroke of the piston and com-



Two-Stroke Engine. Diagrams showing sequence of strokes. See text

pressed sufficiently on the downstroke to drive it through the transfer port G when the piston reaches the lower position (Fig. 3). In larger engines a separate pump is used for this purpose. This type is uneconomical for gas and petrol engines, since if the scavenging is to be reasonably efficient, some of the fuel will escape mixed with the outgoing exhaust gases. This is not so with the oil engine, since air only is used for scavenging and the fuel is not injected until the end of the compression stroke. Other types have more efficient scavenging arrangements. See Double-acting Engine.

Two Thousand Guineas. English horse race. It was inaugurated in 1809, and is held normally at Newmarket on the Wed. of the



Tyburn. Scene at an execution; one of Hogarth's detailed pictures representing the noisy crowd of spectators thronging round the cart in which the criminal with his coffin is being driven to the gallows

Hogarth's Industry and Idleness, plate 11

first spring meeting. It is run over the Rowley mile by three-year-old colts and fillies, and is one of the five classic races. See Horse-racing.

Twyford. Name of several villages in England. One is 3 m. S. of Winchester, Hants, served by a rly. station, Shawford and Twyford. At Twyford House Franklin wrote part of his Autobiography. Another is in Berks,

gave its name to the Middlesex gallows, which stood near the junction of the Edgware and Bayswater Roads from the 12th century until 1783, when it was transferred to Newgate. In 1759 the permanent structure was removed and replaced by a movable gallows, the original site being occupied by the new turnpike toll-house. Marble Arch is close to the site. From 1699 to 1818 a person who secured the conviction of a felon was legally entitled to a certificate called a Tyburn ticket, which exempted him from parish and ward duties in the parish where the offence was committed. Consult Tyburn Tree, A. Marks, 1908; Tyburn Gallows, G. L. Gomme, 1909.

Tyi or Teye. Egyptian queen of the XVIIIth dynasty. A richly furnished Theban tomb yielded in 1905 the mummies of her parents, Yua and Thua, a Syrian immigrant and an Egyptian wife. Tyi wedded Amenhotep III.

Tyldesley. Urban dist. and town of Lancashire, England. It is 5 m. S. by W. of Bolton, and is served by rly. The principal industry is coal mining, and in the town are cotton mills. Pop. est. 18,500.

Tyldesley. Name of several Lancashire and England cricketers. Most celebrated was John Thomas (1873-1930), who was born Nov. 22, 1873, and scored 37,803 runs in first-class cricket, including 86 centuries. In ten years beginning 1899 he made 26 appearances in test matches against the Australians; and in 1910 he headed the English batting averages. He died Nov. 27, 1930. His brother Ernest was born Sept. 5, 1889, and played for the county during 1909-34. A model of consistency as a batsman, he made centuries in seven con-

31 m. W. of London; this is the rly. junction for Henley. There is also a Twyford in Ashdown Forest, Sussex.

Twyford Abbey. Parish of Middlesex, England. It is on the S. bank of the Brent, between Alperion and Hanger Hill, 11½ m. W. of London. It takes its name from a sham Gothic structure, built 1807-09 on the site of an Elizabethan moated manor house; this house, which formerly stood in wooded grounds, was enlarged in 1904, and became an R.C. convalescent home. The manor once belonged to S. Paul's cathedral.

Tyburn. Name of a small stream in London now running underground from Hampstead through Regent's and Green Parks to the Thames at Westminster. It

secutive matches in 1926, played an innings of 256 not out in 1930, and was considered unlucky to have been picked only five times against Australia. Unrelated to them was Richard Tyldesley, celebrated in the 1920s for his stoutness and the remarkable slowness of his deliveries, which regularly took 100 wickets per season, gaining for him first place in the bowling averages for 1929, and an Australian tour in 1924-25.

Tyler. City of Texas, U.S.A., co. seat of Smith co. It is 105 m. E.S.E. of Dallas, and is served by the International and Great Northern and the St. Louis South-Western rlys. More than a third of the cultivated rose-bushes grown in the U.S.A. originate here, between six and seven million being dispatched annually. The first settlement was made in 1844, and in 1870 Tyler was incorporated. In 1894 Texas College for negroes was opened here. Pop. 28,279.

Tyler, JOHN (1790-1862). American statesman, born at Greenway, Va., March 29, 1790. He was member of congress 1816-21, governor of Virginia 1825-27, and senator 1827-36. Elected vice-president of the U.S.A. in 1840 as one of the leading Whigs, he succeeded to the presidency next year upon the death of Harrison in office. Tyler's veto of the tariff bill of 1842 led to the resignation of most of his cabinet and a public repudiation of him by his party. During his term Texas was annexed, and the Ashburton-Webster treaty with Great Britain concluded. He died at Richmond, Jan. 18, 1862. *Consult* Letters and Times of the Tylers, L. G. Tyler, 1884-85.



John Tyler

Tyler, War (d. 1381). English rebel. He appears to have been a tiler at Dartford, Kent, and came into notice when the poll tax of 1381 was being collected. The story goes that a tax-collector insulted his daughter and was killed by him. This brought the discontent to a head and, under Wat Tyler and Jack Straw, men from Kent and Essex marched to London. At Mile End they met the boy king Richard II, from whom Tyler demanded that serfdom should be abolished. Receiving a favourable answer, he led his men on a plundering expedition among London mansions. On June 15 there was

another meeting at Smithfield with the king, whom Tyler insulted, to be immediately struck dead by the lord mayor. *See* English History; Peasants' Revolt.

Tylers' and Bricklayers' Company. London city livery company. The craft it represents came into prominence in the 13th century, and the early members of the guild, which received its first charter in 1568, appear to have been employers rather than actual operatives. The office is at 6, Bedford Row, London, W.C.1.



Tylers' and Bricklayers' co. arms

Tyll Owlglass. Hero of a 16th century German book, Till Eulenspiegel, by a Brunswick monk, Thomas Murner (1475-1536). He is a jack of all trades, a mischief-maker, and a merry fellow. First translated into English by William Copland about 1560, as *The Merry Jest of a Man called Howlglass, and the Many Marvellous Things and Jests which He Did in His Life*, the tale has been several times retold. Till Eulenspiegel is also the name of a symphonic poem by R. Strauss.

Tylor, SIR EDWARD BURNETT (1832-1917). British anthropologist, born at Camberwell, London, Oct. 2, 1832. Ill-health took him to America, where a Mexican tour with Henry Christy, 1856, resulted in a book, *Anahuac; or Mexico and the Mexicans*, 1861, followed in 1865 by *Early History of Mankind. Primitive Culture*, 1871 (*see* Animism), made Tylor the leading anthropologist of the age. After completing a popular manual on Anthropology, 1881, he became reader in that subject at Oxford, 1884, and first professor, 1895. He was made F.R.S. in 1871, knighted in 1912, and he died at Wellington, Somerset, Jan. 2, 1917.

Tympan (Lat. *tympanum*, kettle-drum). In printing, sheet of cloth, parchment, or other material placed between the platen or impression surface and the paper about to be printed. A hand press contains a frame holding an inner and an outer tympan; the outer holding the inner in place. In power presses the tympan covers the packing or make-ready between the platen and the printing surface. *See* Printing.

Tympani (Lat. *tympanum*, a drum). Italian name for orchestral kettledrums. They can be tuned to definite notes, which in early prac-

tice were generally the tonic and dominant of the key. Contemporary composers indicate any tuning they desire.

Tympanum (Gr. *tympanon*, drum). In anatomy, the membrane dividing the inner and outer ear (*q.v.*). In architecture it is the triangular space enclosed by the entablature and the sloping lines of the pediment. The name is also given to the space between the lintel and the arch of a doorway or window.

Tynan, KATHARINE (1861-1931). Irish poet and novelist. Educated at the Dominican convent, Drogheda, she published her first book of verses, *Louise de la Vallière*, 1885. Other volumes of her graceful and musical verse include *Ballads and Lyrics*, 1890; *The Wind in the Trees*, 1898; *Collected Poems*, 1901; *New Poems*, 1911; *Flower of Youth*, 1915. In 1893 she married H. A. Hinkson (1865-1919), barrister and author, lived much in London and at Southborough, Tunbridge Wells, and became a constant contributor of verses and fiction to periodicals. Among her novels are *The Handsome Brandons*, 1898; *A Midsummer Rose*, 1913; *John-a-Dreams*, 1916; *Second Wife*, 1920; *Wives*, 1924; *House in the Forest*, 1928. She published reminiscences of Irish and London literary life in *Twenty-Five Years' Reminiscences*, 1913; *The Middle Years*, 1916; *Years of the Shadows*, 1919. She died April 21, 1931.

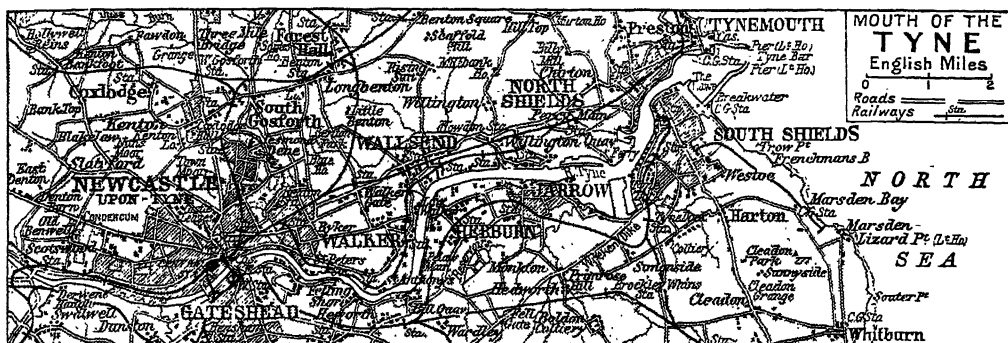
Tyndale, WILLIAM (c. 1492-1536). English translator of the Bible. A native probably of



William Tyndale, Bible translator

Gloucestershire, he was educated at Oxford and Cambridge universities, ordained priest in 1521, and became chaplain to Sir John Walsh at Little Sodbury. Removing to London, 1523, he preached at the church of St. Dunstan's-in-the-West and in the house of Humphrey Monmouth, a rich draper, began his work of translating the Scriptures in such a manner that, while the scholar could approve, the ploughboy might understand.

Forced to leave England in 1524, Tyndale travelled in Germany and Holland. He visited Luther at Wittenberg, began printing the N.T. at Cologne, 1525, continued the work at Worms, whence several copies reached England, and en-



Tyne. Map of the mouth of the English river which flows through the colliery district of Newcastle and North Durham, and is one of the busiest industrial waterways in the world

gaged at Antwerp in controversy with More. At the instigation of Henry VIII, who suspected him of sedition, he was strangled and burnt at the stake at Vilvorde, near Brussels, Oct. 6, 1536.

Tyndale's translation included the N.T., 1525; the Pentateuch, aided by Coverdale, about 1530; and Jonah, 1531. He is said to have left MS. of the O.T. as far as 2 Chron. In arrangement he followed Luther, but his translation, marked by a remarkable mastery of the English idiom, and one of the foundation-stones of the A.V., was mainly from the original texts. It has had an important influence on the development of English prose. A monument to Tyndale was erected at Nibley Knoll, Glos, in 1863. *See Bible; consult Lives, R. Demaus, new ed. 1886; W. B. Cooper, 1924; J. F. Mozley, 1937.*

Tyndall, JOHN (1820–93). British physicist. Born at Leighlin Bridge, co. Carlow, Ireland, Aug. 2, 1820, and educated at the local national school. he became an assistant in the ordnance survey of Ireland, 1839, and was transferred to the English survey, 1842. He accepted an offer to teach mathematics and surveying at Queenwood College, Hants, 1847; but the following year he went to the university of Marburg to study chemistry under Bunsen, and shortly afterwards began publishing the brilliant series of papers which brought him into the front rank of physicists. Notable among these was one on the Magneto-optic Properties of Crystals, 1850.

A lecture before the Royal Institution, 1853, on The Influence of

Material Aggregation upon the Manifestations of Force, established Tyndall as one of the most brilliant and original thinkers of his generation. Already F.R.S., he was at once chosen professor of natural philosophy at the Institution. In 1867 he succeeded Faraday as its superintendent, and carried out a series of researches on radiant heat in relation to gases and vapours which are among his most remarkable investigations. In 1866 he became scientific adviser to Trinity House, undertaking important researches on sound. He retired from the Institution, 1887, and died Dec. 4, 1893.

The phenomenon associated with his name, the Tyndall effect, refers to the scattering of a beam of light by small particles. The extent of the scattering varies inversely as the fourth power of the wavelength of the light, and explains the blue coloration of smoke, blue being at the short wavelength end of the spectrum.

Controversialist as well as thinker, Tyndall wrote *Heat Considered as a Mode of Motion*, 1863; *Sound*, 1867; *Faraday as a Discoverer*, 1868; *Fragments of Science*, 1871; *Forms of Water*, 1872. *Consult Life and Work, A. S. Eve and C. H. Creasey, 1945.*

Tyndareus. In Greek mythology, king of Sparta. His wife Leda became by Zeus mother of Castor and Pollux, and, in some legends, of Clytemnestra and Helen as well.

Tyne. River of N.E. England. The N. Tyne rises in the Cheviots near Carter Fell on the Scottish border, and flows S.E. and S. for 32 m.; the S. Tyne rises in the Pennines E. of Cross Fell in Cumberland and flows N. and then E. for 33 m. to join the N. Tyne near Hexham, whence the united stream flows 30 m. E. to the North Sea. From Newburn and Ryton it marks the boundary between Northumberland and Durham. The lower reach bordered by the Tyne ports, Tynemouth, N. and S. Shields, Jarrow, Wallsend, Hebburn, Walker, Gateshead, and Newcastle, is a busy industrial region. It was severely hit by depression in the shipbuilding industry after 1930. Tunnels under the Tyne for cyclists and pedestrians, connecting Howdon on the N. with Jarrow on the S., were completed in 1950; a third tunnel, for vehicles, was planned. *See Newcastle-upon-Tyne; Tynemouth.*

Tynemouth. Co. and mun. borough and seaport of Northumberland, England. Standing at the mouth of the Tyne, 8½ m. from Newcastle, it has rly. stations and a ferry across the river to S. Shields. There are ruins of a Benedictine priory; near the latter the remains of the castle, the scene of fighting in the Civil War. The priory was a Norman foundation and attained considerable wealth and position. Modern buildings include the block in N. Shields erected for municipal



John Tyndall,
British physicist



Tynemouth, Northumberland. Ruins of the castle, whose walls include the 8th century priory; on the right is the lighthouse

purposes. The port has a considerable shipping trade, for which there is a harbour at N. Shields.



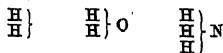
Tynemouth arms

Tynemouth grew up around a priory founded by the Northumbrian king in the 7th century, but its expansion only began early in the 19th century, although earlier it was a centre for the salt and coal industries. In the 20th century it developed considerably as a holiday resort. It was made a borough in 1849, and includes N. Shields, Cullercoats, Preston, Percy Main, East Howdon, New York village, and Chirton, as well as Tynemouth proper. One member has been returned to parliament since 1832. Pop. 66,110.

Tynwald. Name for the old parliament of the Isle of Man. The Tynwald court today is composed of the two branches of the legislature when they meet together for executive business, which includes the control of the finances. Tynwald Hill is the hill where the laws of the island are promulgated after receiving the royal assent. See Keys, House of; Man, Isle of.

Type (Gr. *typos*, blow, mark of a blow). In theology, term for a prophetic symbol, or an impression or representation of some model, which is called the anti-type. A type is meant to strike the human senses with a supersensible idea, e.g. the paschal lamb in the O.T. is regarded as being meant to prefigure the sacrificial death of Christ.

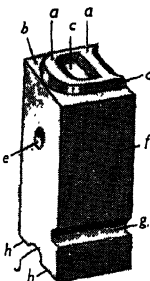
Type. In chemistry, various suggested classifications of compounds. At one time popular, but now rarely used is Gerhardt's theory of type. This supposes that all compounds are derived from the following types of hydrogen :



Hydrogen Water Ammonia

by the replacement of hydrogen atoms by other elements or groups of atoms which play a part analogous to the atom of an element.

Type. In printing, piece of metal or wood containing a raised letter or figure, from which an impression is to be made. Type for books and newspapers is of metal, $\frac{1}{16}$ inch high, and rectangular in shape, the letter being in a form reversed from that of its appearance in print. Movable type is cast in founts or fonts of varying sizes and styles. The chief sizes in ordinary use in book and newspaper printing offices are as follows, each having a distinctive name or being distinguished according to the point system, a point being 0.0138 inch, i.e. 72 points to the inch :



Type. A single piece of type showing the parts. A. Face. B. Shoulder. C. Counter. D. Bevel. E. Pin mark. F. Body or shank. G. Nick. H. Feet. J. Groove.

OLD NAME

Pearl

Nonpareil

Minion

Brevier

Bourgeois

Long Primer

Small Pica

Pica

English

Great Primer

EXAMPLE

New Universal Encyclopedia

New Universal Encyclopedia

New Universal Encyclopedia

New Universal Encyclope

New Universal Encyclo

New Universal Encyclo

New Universal Enc

New Universal En

New Universal E

New Universal

EM QUADRAT. POINT

5

6

7

8

9

10

11

12

14

18

2 Line Pica New Unive 24

There are scores of type faces designed for text or display, each having CAPITALS, SMALL CAPITALS, lower case, *italic*, numerals, points (., : .), accented or other marks, signs, etc.

Each single letter is marked with one or more nicks on the front of its stem to guide the compositor and to distinguish one fount from

another. For large poster work wooden letters are used. See Black Letter; Linotype; Monotype; Printing.

Type-Founding or TYPE-CASTING. Casting of type for printing. Type is cast from type-metal by means of a mould to which is fitted a copper matrix made by a stamping machine from a steel punch or die cut by an expert craftsman. Early printers made their own punches and cast their own type (see Black Letter). Type-found- ing as a distinct industry began at the close of the 16th century, but did not approach uniformity and general excellence in England until the time of Caslon in the first half of the 18th century. Type-casting machinery has been much im- proved, and British type-founders in particular have made remark- able progress in the casting of letters for the production of works printed in Oriental and other foreign languages. See Galley; Printing.

Type Metal. Lead-base alloys used for type casting. They usually contain 10 to 20 p.c. of antimony, and up to 10 p.c. of tin. Their characteristics are low melting point, ease of casting, and good resistance to wear.

Type-Setting or COMPOSITION. Arrangement of type-letters for printing. The work is done by hand or by machinery, either in single letters or in lines ("slugs") of type. See Compositor; Linotype; Monotype; Printing.

Typewriter. Machine for writing in characters resembling print. The first patent for a typewriter was granted to an engineer named Mills in England, Jan. 17, 1714; the first machine to be put to practical use, however, was invented by Charles Thurber in 1843. It was followed in 1856 by that of A. E. Beach for printing embossed



Tynwald. Church of S. John and, left, the ancient Tynwald Hill where the laws of the Isle of Man are annually promulgated on July 5

Volentine

letters for the blind, and, about the same time, by an invention of Sir Charles Wheatstone. Then after several years of experiment Christopher Latham Sholes produced a successful machine which he described as a typewriter. E. Remington and Sons, of Ilion, New York, started making this machine in 1873 and the Remington became the first commercial typewriter. This machine had the type-bars pivoted about a horizontal ring, the arms of



Typewriter. The first commercial typewriter, made by Remington in 1873. Top, Christopher Latham Sholes' daughter using an experimental model made by the inventor in 1872

the type-bars being connected by vertical rods to the levers leading to the keyboard. A rubber cylinder moved the paper, and the impression of the type was supplied by an inked ribbon which unwound automatically from a spool. Sheets of thin paper coated on one side with a solid ink, and called carbon paper, were later used, interleaved with blank sheets, to obtain "carbon" copies of the text at the same time as the original was written through the typewriter ribbon. The pressing down and release of each key in turn moved the paper-carrying cylinder along one space by means of a spring. The roller was moved back and turned ready for the following line by hand. In the original machine each type-bar carried only one character, and the machine typed capital letters only. A later machine introduced in 1878 carried two characters on each type-bar, which in conjunction with a shift-key allowed the machine to type both

upper and lower case letters. The Remington machine was followed by others embodying various new ideas and improvements. The keyboard became standardised, with certain variations in different countries to suit the letter frequency in different languages, and various standard improvements were introduced, e.g. a back spacing key, which made it possible to reverse the carriage one space as necessary to retype a letter, two-colour ribbons, stencil-cutting margin switch, margin adjusters. Various methods of inking the type were used, among them inking pads before the fabric ribbon impregnated with solid ink was introduced. The type-wheels used on a number of early machines gave place to the arrangement of the type-bars in a "basket" or segment so that they all print by a hammer action at a central point. Some typewriters incorporate adding, subtracting, and tabulating mechanisms, others can be used for book-keeping work as well as general typing.

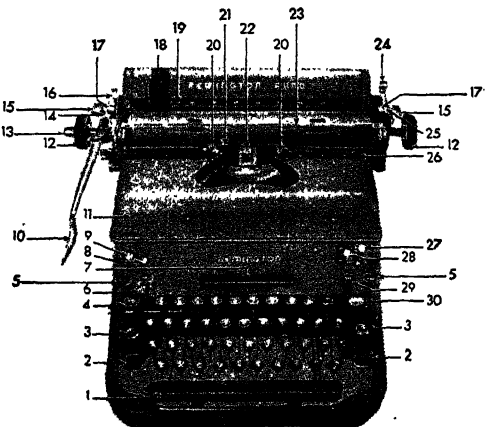
Noiseless typewriters, which make a little but not much noise,

are worked by pressure-printing; the type-bars are controlled by a toggle action and the printed impression is produced by the overthrow of a weighted cam. The portable typewriter, which can be easily carried on journeys, though somewhat slower in action, turns out work equal in appearance to that of a full-size machine.

Typhaceae. Family of marsh and aquatic herbs. Natives of temperate and tropical regions, they have creeping rootstocks, and long, narrow, grass-like leaves. The minute flowers are crowded into cylindrical or globular heads with the sexes separate. The family includes only two genera—*Typha* and *Sparganium* (Bur-reed). See Reed-mace.

Typhoid OR ENTERIC FEVER. Infectious disease caused by the bacillus typhosus. Typhoid fever occurs more or less throughout the world. At one time very prevalent in all large towns, it has been reduced to insignificant proportions where proper sanitation has been adopted. Unpolluted water is the essential preventive.

Contamination of the water supply by infected sewage is undoubtedly the commonest cause; but infection may also be conveyed by milk or food, and some outbreaks have been traced to infected



1. Space Bar. 2. Shift Keys. 3. Shift Lock. 4. Back Space Key. 5. Keyboard Margin Control. 6. Tabulator Clear Key. 7. Tabulator Bar. 8. Ribbon Reverse. 9. Key Release Lever. 10. Carriage Return and Line Space Lever. 11. Snap-off Top Plate. 12. Platen Knob. 13. Variable Line Spacer. 14. Line Space Regulator. 15. Carriage Release Lever. 16. Ratchet Release Lever. 17. Removable Platen Brackets. 18. Adjustable Paper Side Guide. 19. Paper Centring Scale. 20. Card Holder. 21. Alining Scale. 22. Type Guide. 23. Paper Bail. 24. Paper Release Lever. 25. Paper Bail Release. 26. Carriage Scale. 27. Ribbon Indicator. 28. Personal Touch Regulator. 29. Tabulator Key. 30. Margin Release Key.

Typewriter. Diagram showing components of a Remington keyboard margin control machine

By courtesy of The Remington Typewriter Co., Ltd.

shellfish which feed on sewage matter. Typhoid carriers are a great menace, especially in institutions, where they may infect the food of others, if employed in kitchens. In the past typhoid has also taken heavy toll of life in armies in the field, but in both Great Wars its ravages were relatively small, a system of preventive inoculation being widely adopted by the belligerents.

The disease tends to be more prevalent in autumn than in other seasons, and is more likely to attack persons in youth or early adult life than the very young or the elderly. The period of incubation, *i.e.* the interval between infection and appearance of the symptoms, ranges from 8 to 14 days or more. Symptoms begin insidiously, and the patient may have been ill for a week or ten days before the disease is suspected. Early symptoms are headache, shivering attacks, loss of appetite, diarrhoea, bleeding from the nose, and pain in the abdomen. Temperature during the first week rises steadily. Towards the end of the week the spleen becomes enlarged, and there is an eruption of rose-coloured spots on the abdomen. During the second week the fever remains high and the symptoms become aggravated. Death may occur at this stage.

In the third week in a hopeful case the temperature gradually begins to decline, and in the fourth week convalescence usually begins. The disease may be accompanied by grave complications. Ulcers may form in the colon, and perforation of these is a frequent immediate cause of death. The heart muscle may also be affected.

TREATMENT. Absolute rest in bed, good nursing, and careful regulation of the diet are essential. With persistent high temperature, sponging of the body with cold water may be indicated. Chloromycetin may be administered. Solid food should be avoided.

Typhon or Typhoeus. In Greek mythology, a monstrous, fire-breathing giant with 100 heads. He was the son of Ge, the Earth, and was the father of the three-headed dog Cerberus, the Chimæra, and other monsters, and of some of the maleficent winds. Having revolted against Zeus, he was slain with a thunderbolt, buried under Mt. Etna, and seems to have personified the power manifested in earthquakes and volcanoes.

Typhoon (Chinese *tai fun*, strong wind). Tropical revolving storm associated with the China Sea, the Philippine archipelago (where it is called *baguio*), and Japan. Although occurring at any time of the year, typhoons are most frequent towards the end of the hot season, *i.e.* from July to Oct.; during 1893–1918, out of a total of 620 reported in the China Sea and the western N. Pacific, 387 occurred in these months. Like all cyclones typhoons originate over the hottest parts of the ocean, in regions where the trade winds are dying and merging into the humid equatorial calms of the doldrums. Essentially, these storms resemble the depressions of temperate lats., greatly intensified. The steep pressure gradients result in violent winds which whirl round the centre of the system; rainfall is torrential, sometimes accompanied by thunder and lightning; and advancing over the sea it produces enormous and destructive waves. Typhoons rarely penetrate far inland, but the islands lying in their paths, and the Chinese coasts, suffer severely. *See Cyclone; Hurricane; Okinawa; Wind.*

Typhoon. British fighter aircraft of the Second Great War. Designed and built by the Hawker company, the Typhoon had a span of 41 ft. 7 ins., a length of 31 ft. 11 ins., and was powered by one 2,200-h.p. Napier Sabre 24-cylinder sleeve-valve engine. It was the first Allied fighter to exceed 400 m.p.h. on service. Armament consisted of either twelve .303 Browning machine-guns or four 20-mm. cannon. Each wing had a rack for one 1,000-lb. bomb, two 500-lb. bombs, or four rocket projectors. The prototype first flew in Feb., 1940, but after the defeat of France production was stopped to enable the Hawker company to devote maximum production to Hurricanes. From May, 1941, the Typhoon served in most theatres of war, proving exceptionally useful as a ground attack fighter. Rocket-firing Typhoons of the 2nd tactical air force were used in W. Europe, 1944–45, as tank destroyers.

Typhus Fever (Gr. *typhos*, smoke, stupor). Acute infectious disease known also as hospital fever, spotted fever, gaol fever, and camp fever. The micro-organism responsible is of the Rickettsia group, and infection is conveyed by the body louse and possibly by the head louse, as well as by mites, fleas, and ticks. Rats and mice can be a reservoir of infection. Typhus is closely associated with

filth and overcrowding, and its prevalence in former years in prisons, hospitals, and other places where verminous persons were crowded together led to the above names being given to the disease. Typhus is highly contagious, and great epidemics have prevailed from time to time in many parts of the world. Improved sanitary conditions have led almost to the disappearance of the disease in England and Wales, but there was a serious outbreak in the Balkans early in the First Great War, and in the Second it occurred among refugees and in concentration camps.

The incubation period is about 12 days. The onset is usually abrupt, with chills or shivering, fever, headache, and pains in the back and legs. The temp. rises rapidly, the tongue is white, the face flushed, and vomiting severe. An eruption appears on the skin from the third to the fifth day. In severe cases the delirium becomes worse, coma supervenes, the action of the heart becomes feeble, and death occurs from exhaustion. The mortality varies in different epidemics from 12 to 20 p.c. Treatment is symptomatic. Cold sponging or cold packs are of value when the temp. is high. Mild aperients are necessary, and a light nourishing diet. D.D.T., by destroying the insects which carry typhus, is a preventative, as was demonstrated at Naples, Oct., 1943, when the whole population was treated and an epidemic prevented. *Consult Rats, Lice, and History, H. Zinsser, new edn., 1942.*

Typographic Etching. Process invented about 1873, to produce a metal block by means of an electro or cast of the actual lines of a drawing. Since 1890 the use of the process has been confined almost entirely to the production of maps, plans, etc.

Typography. Broadly, the art of printing from movable type or letters. But the term has become increasingly used in a special sense confining it to the design, selection, and arrangement of type rather than the actual operation of printing; in other words the art of so disposing type as to achieve the most effective and harmonious appearance in the printed pages of a book or other publication. A typographical expert possesses a wide and intimate knowledge of existing styles of type, and is concerned with the selection of the most appropriate styles and sizes of type for a given purpose, taking into consideration also such mat-

ters as widths of margins, spaces between lines, headings, initial letters, illustrations, tabulated material, etc. Good typography is a feature of the highest class of artistic book production. Consult *First Principles of Typography*, S. Morison, 1935; *Introduction to Typography*, O. Simon, 1945.

Týr (Old Norse *týr*, god). Scandinavian name of the old Teutonic god of war, called in Anglo-Saxon *Tiw*, and in Old High German *Ziu*. His name is cognate with Lat. *deus*, Sanskrit *devas*, god, and Greek *Zeus*. The son of Odin, he bound the demon wolf Fenrir, which bit off his hand. Týr was identified with the Roman Mars, whence the third day of the week, *Martis dies*, was called *Tiwes daeg* or Tuesday.

Tyrant (Gr. *tyrannos*). In Greek history, a name applied to a despot who ruled without constitutional sanction. In the 7th and 6th centuries B.C. oligarchies of nobles, which had replaced the old kings, ruled most of the city states of the Greek world, and were overthrown by able leaders of the unprivileged classes, wealthy or poor. These leaders, who seized the supreme power, and handed it on to their descendants, were not necessarily tyrants in the modern sense, which begins to be associated with the word in Sophocles and Plato. They were often vigorous rulers, who increased the power of the state, erected splendid buildings, and encouraged literature and the arts. Many of them employed foreign mercenaries. Becoming degenerate, they were swept away by revolutions, conspiracies, or foreign intervention. A later series of tyrants was set up in many Greek cities by the Macedonian kings. See Cypselus; Dion; Dionysius the Elder and Younger; Hiero I; Peisistratus; Periander; Phalaris; Polycrates.

Tyrcannel, RICHARD TALBOT, EARL OF (1630-91). Irish soldier. The son of Sir William Talbot, an



Earl of Tyrconnel,
Irish soldier
After S. Harding

Irish politician, he belonged to an R.C. family settled in Ireland for over 400 years. After fighting at Drogheda against Cromwell, he left the country and served the royal family. In 1660 he returned to England and was attached to James, duke of York, serving with the fleet. When James became king, Talbot, in the full confidence

of his master, was made commander-in-chief in Ireland, where he had held a command since 1681, and was created earl of Tyrconnel. James II created him duke of Tyrconnel in 1691, but the title was recognized only by the Jacobites. As lord deputy after 1687 he worked to secure Ireland for James, which he did by displacing as many Protestants as he could from both civil and military employment. He died at Limerick, Aug. 12, 1691.

Tyre. Alternative spelling of tire (*q.v.*), a hoop, band, or inflated rubber tube on the rim of a wheel.



Tyre, Syria. The modern city and harbour, built on the site of the ancient port, showing remains of the mole on the extreme left

Tyre (anc. Tyrus). English name for a city of ancient Phoenicia. It is first mentioned in the Amarna tablets of the 14th century B.C., when it formed part of the Egyptian empire. The city itself was built partly on the mainland (Palaetyrus, old Tyre), partly on an island, now a peninsula, on which was erected one of the strongest fortresses of antiquity. Its greatness dates from the 11th century B.C. and is reflected in the activities of Hiram, the friend of David and Solomon. It established colonies in Sicily, Sardinia, Spain, (Gades), Africa (Carthage), and sent fleets to trade with India.

In ancient times it was besieged by Shalmaneser and Sargon, kings of Assyria, Nebuchadnezzar, Alexander the Great, Antigonus of Syria, and always offered a desperate resistance. When finally it came under Roman rule with the rest of the country (64 B.C.), it was granted freedom and a constitution, and Severus made it a colony. Its extensive trade and manufacture of metal and glass wares, of woven stuffs, and especially of purple dyes, made it extremely prosperous. In 638 it fell into the hands of the Arabs; in the time of the Crusades it was

taken by Baldwin, king of Jerusalem, and became the seat of an archbishop, one holder being the historian William of Tyre. In 1291 it was recovered permanently by the Mahomedans.

The modern town, called Sur (rock), which is about 50 m. S. of Beirut, has some 5,000 inhabitants of very mixed stocks; it is the seat of a Greek archbishop. The harbour is choked up with sand and trade has been diverted to Beirut. There are interesting remains of an old church of crusading times. See Phoenicia.

Tyrol. See Tirol.

Tyrone. County of N. Ireland. With 1,218 sq. m., it contains the Sperrin Mts. and other ranges, but in the east is a level tract. The rivers include the Derg and the Blackwater, while the Foyle divides the co. from Londonderry. Fea is one of several small loughs; on the E. boundary is Lough Neagh. Omagh is the co. town; other towns are Strabane, Dungannon, and Newtown Stewart, while Clogher, once the seat of a bishop, Dromore, and Fintona are also in the county. Oats, potatoes, and flax are grown, and cattle and poultry reared. Manufactures include linens, woollens, earthenware, chemicals, whisky, soap. Tyrone returns four members to the N. Ireland parliament; for the U.K. house of commons it votes partly in the co. constituency of Fermanagh and S. Tyrone and partly in that of Mid-Ulster. Pop. 127,586.

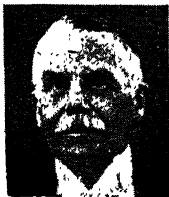
Tyrone, EARL OF. Irish title held by the families of O'Neill, Power, and Beresford. In 1542 it was conferred on Conn O'Neill, head of a famous Irish family. His grandson Hugh, 2nd earl, led the Irish in their rising against Elizabeth and James I. After having



Tyrone, N. Ireland. Map of this Ulster county

gained experience by serving with the English forces in Ireland, he revolted about 1593 and, aided by Spain, carried on hostilities until 1607, when he left the country. Having been attainted in 1614, he died in Spain, July 20, 1617. In 1673 Richard Power was made earl of Tyrone, but in 1704 the title became extinct. One of his descendants married Sir Marcus Beresford, who in 1746 was made earl of Tyrone. His son was made a peer of the U.K. in 1786, and in 1789 marquess of Waterford (*q.v.*). See Ireland.

Tyrrell, William George Tyrrell, Baron (1866-1947). British diplomatist. Son of a judge, he was born Aug. 17, 1866, and educated in Germany and at Balliol College, Oxford. Entering the foreign office, 1889, he was secretary to the imperial defence committee, 1903, and private secretary to Sir Edward Grey during 1907-15. Permanent under-secretary for foreign affairs, 1925, he played a prominent part in the negotiation of the Locarno treaties; and in 1928-34 was a highly successful British



Lord Tyrrell, British diplomatist

ambassador in Paris. On retirement he became president of the British board of film censors. Knighted 1913, he was raised to the peerage in 1929. He died March 14, 1947, leaving no heir.

Tyrrell, George (1861-1909). British theologian. Born in Dublin, Feb. 6, 1861, and educated at Rathmines, he was much influenced by Father Dolling, and in 1879 joined the R.C. communion. After being admitted to the Society of Jesus and attracting notice as a fervent Thomist, he taught in Malta, was ordained priest in 1891, and for two years engaged in mission work, which he gave up to write. Then began a period of controversy, aroused by a paper on Hell which Tyrrell contributed to *The Weekly Register*, Dec. 16, 1899. Tyrrell left the Society of Jesus in 1906, criticised the papal encyclical on Modernism, and died at Storington, July 15, 1909. See Modernism; consult also Father Tyrrell's *Modernism*, H. Egerton, 1909; *L'Affaire Tyrrell*, R. Gout, 1910; *Autobiography and Life of George Tyrrell*, M. D. Petre, 1912.



George Tyrrell, British theologian

Tyrrell, or Tirel, Walter (fl. 1100). Reputed slayer of

William Rufus. Lord of Poix, in Picardy, he was brought from France by William with whom he was on friendly terms. In 1091 he was at the court of the French king, but returned to England, and held the manor of Langham, Essex. He was present when William Rufus was killed, in the New Forest, Aug. 2, 1100, and was generally believed to have shot the fatal arrow. There is considerable doubt on the matter, and Tyrrell himself firmly denied the allegation.

Tyrrhenian Sea. Portion of the W. Mediterranean Sea. It lies between the W. coast of Italy and the islands of Corsica and Sardinia and is N. of Sicily. See Italy; Mediterranean Sea.

Tyrtæus (c. 650 B.C.). Greek lyric poet. Probably an Ionian by birth, he made his home in Sparta, where his martial songs in elegiac verse did much to inspire the Spartans in the second Messenian War. Only fragments of his verses have been preserved.

Tze-hsi (1834-1908). Dowager empress of China. Born in Peking, Nov. 17, 1834, she entered the seraglio of the emperor Hien-fung at the age of 15, and by her beauty and wit soon rose to be second to the empress Tze-an. On the death of Hien-fung, 1861, her son, Tung-chih (1856-75), came to the throne, but during his reign and that of his successor, Kwang-su, Tze-hsi wielded the imperial power. Assisted by Li Hung-chang she ruled wisely and successfully until the war with Japan in 1894-95 brought discontent. She re-established her authority by a *coup d'état*, and suppressed the opium traffic. She died Nov. 15, 1908, after one of the most remarkable female reigns in history.



Tze-hsi, Dowager Empress of China

THE history of this letter is for the most part the history of the letter V, which is said to have evolved from the Semitic *vau*, or hook (see the introductions to F and V). U is a much later variation, first clearly recognized in the Latin minuscule alphabet. Up to the end of the 2nd century A.D. Latin inscriptions in capital letters used the V for both vowel and consonant. But the minuscule, or cursive, form of the letter was rounded at the base and had a final descendant stroke: **U**. Both forms were used indiscriminately for V vowel and consonant. In course of time the V form was preferred for the beginning of a word, and the u form elsewhere; and as the consonant

U occurred more commonly at the beginning of the word, later medieval writers gradually adopted the practice of using V for a consonant and u for a vowel, very much as in the distinction between I and J. Where the vowel also required a capital letter, a larger version of the rounded form above was used. Like the modern capital J, the familiar capital U of today was virtually a printer's invention. It was unknown in classical Roman times, and, again like capital J, lacks the balance and distinction of the Roman letters. Hence the endeavours on the part of many typographers to popularise the form historically more justifiable, derived directly from medieval MSS., with the final descendant stroke: **u**.

U Twenty-first letter and fifth vowel of the English and Latin alphabets, if it be regarded as distinct from V in the latter. It has various sounds, whether used alone or in combination with other vowels. It equals a long oo in *truth*, short oo in *bull*, pull, short u in *nut*, *iu* (*yu*) in *duke*, *funeral*, short i in *busy*, *business*, and short e in *bury*. *Ua* equals *wa* as in *assuage*, *language*, or long Italian *a* as in *guardian*. *Ue* may sound like *wē* as in *conquest*, short e as in *quest*, *iu* (*yu*) in *cue*, *hue*, and is often mute at the end of words as in *antique*, *catalogue*, *fatigue*, *rogue*. *Ui* equals *wi* as in *anguish*, *languid*; short i as in *guilt*, *biscuit*; *iu* (*yu*) in *suit*, *nuisance*, and less emphatic *juice*; and almost oo as in *cruiſe*, *fruit*. *Uo* equals *wo* in *quote*, but not in *liquor*; and *uy* equals long i, the diphthong, not the Italian sound, in *bug*. See Alphabet; Phonetics; Pronunciation.

U. Title which precedes some names in Burma. Burmese politicians whose names have become familiar in Great Britain are indexed as though U were the first letter.

Uakari. Genus *Uacaria* of small American monkeys, distinguished by their short tails. There are three species, whose names—the bald, the red-faced, and the black-headed uakari—indicate their distinctive points. The two former have brilliant scarlet faces; but while the first has scant sandy hair, the other has deep chestnut. The third species has yellowish back and sides, reddish-brown loins, and black head and feet. Uakaris occur in companies in the tops of the trees in forests, living on fruit and flowers.

U Aung San (1914-47). Burmese politician. Born of peasant stock, he went to study law at Rangoon university. Engaged in revolutionary activities, he fled to Japan after the outbreak of the Second Great War, returning as head of the so-called Burma national army. He later dissociated

himself from the Japanese, formed an underground resistance movement, opened negotiations with the British, and gave valuable aid to the 14th army. The force U Aung San headed was the nucleus of the Anti-fascist People's Freedom League, from 1946 a powerful factor in Burmese politics. In a post-war interim govt. he was vice-president of the executive council, and having negotiated with C. R. Attlee an agreement in London, obtained a majority in the first Burmese constituent assembly, 1947. But on July 19 he was assassinated with six of his ministers in Rangoon, Thakin Nu taking his place.

Ubangi, OUBANGHI, OUBANGUI, OR WELLE (UELE). River of Africa. It rises as the Welle near the Sudan frontier of the Belgian Congo, and flows W. as far as Fort de Possel and thence almost due S. to its junction with the river Congo. The Ubangi and its N. tributary the Bomu form the boundary between the Belgian Congo and French Equatorial Africa. The river is impeded by rapids, but may be ascended as far as Zongo by small steamers, and above the rapids near Zongo, as far as the confluence of the Welle and the Bomu by small native boats. See Africa; Congo.

Ubangi-Shari. District of French Equatorial Africa. It lies N. of the Ubangi-Bomu river; W. of the Anglo-Egyptian Sudan; E. of Cameroons; and S. of Chad territory. Its main river is the Shari, which flows N.W. into Lake Chad, and on which stands the administrative centre of Fort Archambault. Sleeping sickness is prevalent. Bangui, on the right bank of the Ubangi, is the capital. Until 1920 Ubangi-Shari-Chad constituted a single colony. Area, 238,767 sq. m. Pop. approx. 1,065,000.

Ubeda. Town of Spain, in the Andalusian prov. of Jaén. It stands on a plateau 2,000 ft. high,

on the Granada rly. 74 m. E. by N. of Córdoba. The surrounding fertile Loma de Ubeda has vineyards, olive plantations, and pastures for horses. There are portions of the old walls, a castle with many towers, and among churches the 16th century San Salvador, the Gothic San Pablo, and the Corinthian San Nicolás. The Palacio de las Cadenas contains municipal offices, and here is the Colegio de Escolapios. An annual fair is held. Pop. 23,900.

U-boat. Abbreviation of *Unterseeboot*, the German name for submarine. In both Great Wars such vessels had the prefix U, UA, UB, or UC, followed by a number. In the First Great War, the Germans had in service 810 submarines, of which 210 were lost in action or founded. The vessels ranged from 450 to 1,950 tons, and were responsible for sinking some 4,500 vessels totalling approx. 11,000,000 tons. A few cargo-carrying U-boats of 2,160 tons took freight to Germany from the U.S.A. until that country entered the war in 1917. Freight U-boats, of which the Deutschland was best known, had a range of 20,000 m. at a speed of 6 knots.

By the Versailles treaty, Germany was forbidden to construct U-boats, but between the wars kept abreast of submarine development by building in foreign countries. In 1935 she started at home and at the beginning of the Second Great War had 57 U-boats in service. By the end of the war 1,155 had been completed, the bulk of them by prefabrication. Of these, 778 were lost, approx. 500 being destroyed at sea by British and Imperial naval and air forces, and about 100 by R.A.F. attacks on U-boat pens and building yards. These craft ranged from 626 to 1,000 tons and destroyed 1,332 merchant ships totalling 7,596,645 tons. The fewer sinkings by U-boats in this war were due to institution of the Allied convoy



Paolo Uccello. The Rout of San Romano, a highly decorative battle-piece by this Florentine painter, now in the National Gallery, London

system at the outbreak of hostilities and the advance in anti-submarine measures. A few 1,600-ton U-boats acted as submarine supply ships and to carry freight between Germany and Japan. *See* Atlantic, Battle of; Navy; Second Great War; Submarine.

U-boat Pen. Shelter built by the Germans in the Second Great War to protect U-boats from air attack while in dock. Pens were constructed at most of the principal submarine bases in Germany and occupied Europe. Built of concrete reinforced with steel girders, they were 368 ft. long, 73 ft. wide, and 30 ft. high, and could each accommodate 10 ocean-going submarines or 30 smaller types. They were considered bomb-proof until Aug. 12, 1944, when those at Brest were penetrated by 12,000-lb. bombs dropped by the R.A.F. The Finkenwarder U-boat pens at Hamburg were destroyed by British occupation troops on Oct. 21, 1945.

Ucayali. River of Peru, S. America. The longest and greatest in volume of the main headstreams of the Amazon, it is formed by the union of the Apurimac and Urubamba, and flows N. to join the Marañón in the N.E. of Peru and form the Amazon. With the Apurimac the Ucayali has a length of 1,500 m. One source is at Lake Junin or Chinchaycocha, 100 m. N.E. from Lima. The Ucayali is a sluggish stream less than 1,000 ft. above sea level; the headstreams are over 10,000 ft. in elevation.

Uccello, PAOLO DI DONO (c. 1397-1475). Italian painter. Born in Florence, he was trained as a goldsmith, and became famous for his love of perspective. He assisted Ghiberti with the first of two doors for the Florentine baptistery, and after spending some time in Venice (where he

executed mosaics for the façade of S. Pietro), returned to his native city to carry out the equestrian fresco of Sir John Hawkwood in the cathedral. Other masterpieces were designs for the cathedral windows, and battle pieces for the Medici palace. One of his last works was an altarpiece for the confraternity of Corpus Christi at Urbino. Although few, the works of Uccello are of the highest importance in Florentine painting of the period. One of his three extant battle pieces is in the National Gallery, London; the others are in the Uffizi Gallery and the Louvre, the latter possessing also his portraits of Giotto, Donatello, Brunelleschi, and himself. *Pron.* Oochello.

Uckfield. Town of Sussex, England. It is about 9 m. N.E. of Lewes and 5 m. S. of Ashdown Forest on the main London-Eastbourne road, and has a rly. station. In the 17th century there was an ironfounding industry, but trade now is in farm produce and implements. The church has a 15th century tower. Pop. 3,557.

Udaipur. City and former state of India, now part of Rajasthan, of which its ruler became maharajpramukh. The state, also known as Mewar, lies S. of Ajmer. The N. contains the wildest por-

tion of the Aravali Hills. Maize, bajra, gram, tobacco are grown; sheep and goats are reared. Area, 13,170 sq. m. Pop. 1,926,698.

The city is one of the most picturesque in India, with a granite and marble palace. It was founded in 1568, and contains the Jagannath temple (c. 1640), in the Indo-Aryan style. The Udaipur-Chitorgarh rly. was opened in 1898. Pop. 59,648.

Udall OR **UVEDALE, JOHN** (c. 1560-92). English Puritan. Educated at Christ's and Trinity Colleges, Cambridge, he became the incumbent at Kingston-upon-Thames, but was deprived in 1588 for writing tracts against the bishops. He then became a preacher at Newcastle, and in 1590 was tried unfairly and condemned to death for complicity in the Marprelate tracts. After two years in prison he was pardoned, but died immediately on release. In 1593 appeared his Hebrew Grammar and Dictionary.

Udall, NICHOLAS (1506-56). English schoolmaster and playwright. A native of Hampshire, he was educated at Winchester and Corpus Christi College, Oxford, and was a friend of John Leland. Successively headmaster of Eton, vicar of Braintree, prebendary of Windsor, rector of Calbourne, I.O.W., playwright to Queen Mary, and headmaster of Westminster, he wrote short plays for performance at court or by his scholars. Udall assisted in the translation of Erasmus's paraphrase of the N.T. and wrote Ralph Roister Doister, the earliest known English comedy, in rhyming doggerel. He was buried in S. Margaret's, Westminster.

Uddevalla. Seaport of Sweden. Situated 48 m. N. of Gothenburg, at the head of Byfjord, it is a rly. junction, and has a school of navigation. Sugar refineries, woodpulp mills, granite quarries, shipyards, and textile mills are found here. Pop. 21,437.



Udaipur, India. The Jagnewas palace, built on an island.

Udine. Prov. of Italy. It slopes from the Carnic Alps to the Gulf of Venice, and is drained by the Tagliamento and its tribs. Hemp, flax, silk, wine, and hides are the principal products. It lies in the fertile plain of Friuli (q.v.). Area 2,765 sq. m. Pop. 810,000.

Udine. City of Italy, capital of the prov. of Udine. It is 84 m. by rly. N.E. of Venice, on the Roja



Udine, Italy. Clock tower in the principal square, resembling that at Venice

Canal, and in the midst of a fertile, cultivated plain. The Romanesque cathedral, a fine archiepiscopal palace, the Palazzo Bartolini, with a museum of antiquities, and a large library are the chief buildings of interest. In the Second Great War the cathedral roof was burnt and the church of S. Francis gutted by bombs. Silks, velvets, leather, paper, and sugar are the principal products; flax and hemp the chief articles of trade. The city was the capital of Friuli in the 13th century, and passed to Venice in 1420. In the First Great War Udine was an important base of the Italian army on the Isonzo front. Captured by the Austrians, Oct. 29, 1917, it was reoccupied by the Italians, Nov. 3, 1918. Udine was entered May 1, 1945, by the British 6th armoured div. after the surrender of the Germans in Italy in the Second Great War. Pop. 63,098.

Ueberweg, FRIEDRICH (1826-71). German philosopher. Born at Leichlingen in the Rhineland, Jan. 22, 1826, he was educated at

the universities of Göttingen, Berlin, and Bonn, and after a period passed as a tutor in philosophy was made professor at Königsberg. He died June 9, 1871. Ueberweg was a representative of idealistic realism, according to which the contents of the perceptive faculty are subjective signs of real events. Perception is directed towards an objective outside itself, not towards the sensations, which we first refer to an object. His most important works are *System of Logic*, Eng. trans. 1871; *History of Philosophy*, Eng. trans. 1872.

Ufa. River of Russia. Rising in the Ural Mts. in the S. of the region of Sverdlovsk, it flows first N.W. and later S.W. into the Bashkiria A.S.S.R., and after a course of c. 500 m. joins the Bielaia 2 m. above the town of Ufa.

Ufa. Chief town of the Bashkiria autonomous republic, R.S.F.S.R. An industrial and manufacturing centre in the S.W. of the Ural region, it stands near the confluence of the Ufa and the Bielaia, and is a rly. junction. It is known to Russians as the second Baku because of its extensive production of oil, and its reserves in 1938 were estimated at 2,700 million tons. Its industries also include copper, smelting, rope-making, brewing, and fruit liqueur distilling. In 1574, when Kazan had fallen, the Russians advanced through the then Finnie-Bashkirian state and founded Ufa. Pop. 245,863. See Bashkir.

Uffington. Village of Berkshire, England. It lies at the foot of the downs, 4 m. S. of Faringdon, and has a rly. station on the main line to the West. It was the birthplace of Thomas Hughes, who described it in *Tom Brown's Schooldays*. The fine E.E. church has a set of 11 consecration crosses; but its spire was "beat down by a tempest" in 1740. Above Uffington rises White Horse Hill (856 ft.) with the oldest chalk figure of a white horse in England; near is Uffington Castle, an ancient earthwork. Pop. 453. See White Horse.

Uffizi Gallery. Art gallery in Florence. Designed originally by Giorgio Vasari as government offices (*uffizi*) for the dukes of Tuscany, and completed in 1574 under Duke Francesco I, it became the home of the Medici art treasures. Under succeeding Medici princes and the later house of Lorraine the collection was gradually enlarged. In 1860 it passed into the hands of the Italian

government. Among the world-famous masterpieces in the gallery are Botticelli's *Venus Rising from the Sea* and *Adoration of the Magi*, Sodoma's *S. Sebastian*, Filippino Lippi's *Adoration of the Magi*, Michelangelo's *Holy Family*, Fra Angelico's *Coronation of the Virgin*, Sebastiano del Piombo's *Fornarina*, and Titian's *Flora*. All the paintings were moved out of Florence during the Second Great War. The gallery was badly damaged throughout by blast from explosions during German demolitions. See Pitti Palace.

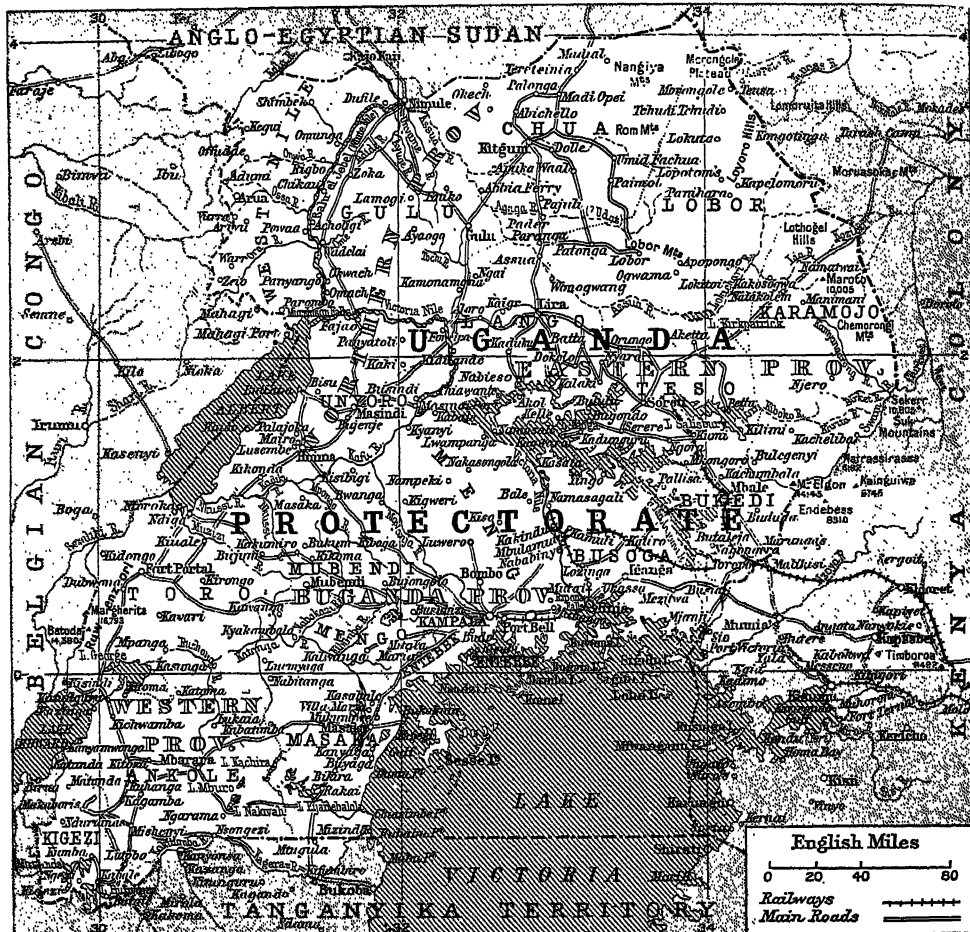
Uganda. British protectorate in Central Africa. It has frontiers with the Anglo-Egyptian Sudan, Kenya Colony, Tanganyika, and the Belgian Congo. Of its area of 93,981 sq. m., 13,680 sq. m. are water comprising parts of Lakes Victoria, Edward, and Albert, and the whole of Lakes George, Kioga, and Salisbury.

Uganda comprises the N. portion of the great African plateau between the two great African rift valleys and has an average elevation of 4,000 ft.; it drains almost entirely to the Mountain Nile (Bahr-el-Jebel). The Victoria Nile and the Kioga lake system occupy a central depression in the plateau.

There are mt. ranges in the S.W., culminating in the extinct volcano, Mt. Elgon, 14,097 ft.

The Ruwenzori range, rising to a height of 16,800 ft., consists of a non-volcanic chain of peaks extending for about 70 m. As the slopes at 9,000-12,000 ft. experience a rainfall of 200 ins. a yr., they are usually veiled in mist and cloud, and are covered by a luxurious rain forest with enormous specimens of giant groundsels, lobelia, and heather. Owing to the heavy snowfall and the protection by cloud from the equatorial sun, there are large glaciers which descend almost to the vegetation line. At Entebbe (3,860 ft.), on Lake Victoria, the monthly mean temps. in Jan. and July are 71° F. and 69° F. respectively; rainfall is greatest in spring, the April total being 10 ins. out of a yearly 58 ins.

The soil is fertile, but methods of cultivation have led to erosion. The chief crops are cotton, tobacco, rye, coffee, tea, groundnuts, and sugar, in addition to foods for native consumption, sweet potatoes, wheat, maize, millet, and bananas. Mineral production has not been on a large scale, but tin is mined, quartz, manganese, iron, copper, and phosphates are being developed. Nearly every African animal, bird, or reptile



Uganda. Map of the extensive British protectorate of Central Africa, traversed by the upper courses of the Nile

occurs within Uganda's bounds. Ivory was long its principal export.

Total population (1948 census) is 4,550,000 of whom some 30,000 are Asiatic, 3,000 European. The Africans are of many tribes, the largest group being the Buganda (from whom the protectorate is named), c. 1,000,000; pygmies live in the Semliki valley. The early history of Uganda is unknown, but from 1877 it was the scene of many inter-tribal wars. The English tried to establish order before April 1, 1894, by agreement with Germany; they established a protectorate, a step much criticised but highly successful in its results.

A British governor is assisted by an executive and a legislative council, three members of which must be Africans. Buganda, the most important prov., is under the direct rule of the Kabaka and his govt. and a native assembly. The natives own the land.

Entebbe is the administrative, and Kampala the chief commercial, centre. Near Kampala is Makerere university college, one of the chief educational institutes for natives in Africa. Primary education was in the hands of missionaries until 1925, since when it has received increasing support from the govt. The roads are excellent and there is rly. communication between Kampala and Mombasa, with branch lines serving the lakes, on which there are steamer services. For the hydro-electric scheme near the head of the Nile, designed to provide Uganda with power for industrial development, see Owen Falls Dam. See also Africa; East Africa, Conquest of.

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Agriculture in Uganda, ed. J. D. Tothill, 1940; Uganda Handbook, H.M.S.O.

Ugolino della Gherardesca (d. 1289). Italian soldier. Member of an ancient Pisan family, in 1274 he attempted to found a principality. On his failure he escaped to Florence, but eventually forced his entry into Pisa and established himself there. In 1288 he was overthrown and, together with his sons, Gaddo and Uguccione, and two nephews, was cast into prison and starved to death. The story is told by Dante in the *Inferno*, Canto 33.

Ugrian. Term denoting a subdivision of the yellow race. Derived from a regional or ethnic name on the Ural slopes, it may be limited to the Ostyak, Voguls, and Magyars, or may include the Samoyeds.

Uhlán (Turk. *oghlan*, a youth). Word used by the Tartars for a certain type of soldier. It was adopted

by the Poles for mounted men armed with the lance. Later the Prussians gave the name to regts. of cavalry, these being armed with the lance and used for scouting.

Uhländ, JOHANN LUDWIG (1787-1862). German poet. He was born April 26, 1787, at Tübingen, and studied law at the university there. In 1812 he received a legal appointment at Stuttgart, but resigned it after two or three years. He published *Poems* in 1815, and



Ludwig Uhländ,
German poet
After Morff

added many fresh pieces to the new editions which were constantly demanded. He wrote many excellent romantic ballads, and won a leading position among German lyrists. His ballad *The Luck of Edenhall* is familiar in Longfellow's translation. He was professor of literature at Tübingen, 1829-33, and in 1848 was a prominent Liberal member of the German National Assembly. His writings include, besides early plays, Walther von der Vogelweide, 1822; *On the Thor Myth*, 1836; *Old High and Low German Folk Songs*, 1844-45; *Writings on the History of Tradition and Legend*, 8 vols., 1865-73. Uhländ died at Tübingen, Nov. 13, 1862. His *Songs and Ballads* were translated by W. W. Skeat, 1864.

Uigur or **UGHUR**. Ancient mounted nomads of Turkic stock in E. Turkistan. Reputed to be descended from the Hiungnu, they established a kingdom, under which Nestorian missionaries in the 7th century introduced their script, based upon primitive Aramaean, which the Mongols afterwards imitated. The Uigurs have been absorbed by the surrounding Mongols, Chinese, and Tartars.

Uinta. Range of mts. in the N.E. part of Utah, U.S.A. It connects the E. and W. ranges of the Rocky Mts. and reaches in Gilbert Peak an alt. of 13,688 ft. See *Rocky Mts.*

Uist, NORTH. Island of the Outer Hebrides, in the Scottish co. of Inverness. Lying S.W. of Harris, it is about 18 m. long and of average width about $\frac{1}{2}$ m. Its E. coast is indented by sea-lochs which almost divide the island into several islets. Eaval in the S.E. reaches 1,138 ft. At the head of Loch Maddy, a well protected natural harbour, stands Lochmaddy, the chief village. Notable

among ancient remains are those of the old church of the Holy Trinity at Carinish. Pop. approx. 3,200. *Pron.* Wist.

Uist, SOUTH. Island of the Outer Hebrides, in the Scottish co. of Inverness. It lies 7 m. S. of N. Uist, Benbecula being between the two. Its greatest length is 22 m. and greatest breadth 8 m. Flat in the N. and W., it is elsewhere mountainous, high points being Ben More (2,035 ft.) and Hecla (1,988 ft.). Lochboisdale, lying on a deep sea-loch to the S.E., is the chief place and has a pier. Small farming, crofting, and some sheep raising are carried on. Pop. approx. 4,800.

Uitenhage. Town and dist. of the Cape Province, South Africa. The town is 21 m. by rly. N.W. of Port Elizabeth, lying in the valley of the Zwartkops river. It is an agricultural centre, and on irrigated land there are large fruit and flower nurseries. Textile factories, rly. workshops, and wool-washing concerns give other employment. Uitenhage was founded in 1804. Pop. 26,267. *Pron.* approx. Out-en-ha-gha.

Uitlander (Dutch, foreigner). Term applied in the Transvaal during the 19th cent. to white men other than Boers. On the formation of the South African Republic, the burghers refused civil rights to all aliens. The word is sometimes translated into English as Outlander. See *Jameson Raid*; *South African War*; *Transvaal*.

Ujiji. Town and lake port of Tanganyika Territory. Formerly the terminus of the great caravan route to Lake Tanganyika, it is on the E. side of the lake, 4 m. S. of Kigoma, the terminus of the Tanganyika rly. It was an important slave centre, especially under Tippoo Tib. Ujiji was first visited by Burton and Speke in 1858, and here Stanley found Livingstone in 1871. Occupied by the Germans in 1900, it was captured by the Belgians in 1916, and handed over to the British in 1921. Pop. 25,000.

Ujjain. Town of Madhya Bharat, India, once capital of Gwalior state and of the ancient state of Malwa. It stands on the right bank of the river Sipra, 138 m. by rly. N.N.W. from Khandwa. It is surrounded by old walls with towers and contains Hindu temples, Mahomedan mosques, and, outside the walls, an old observatory from which the initial meridian of longitude of the Hindu astronomers was taken. Cotton spinning is carried on. The ruins of the ancient city lie 1 m. N. Pop. 72,729.

Ukase (Russ. *ukaz*, ordinance or edict). Edict issued by the Russian government. In pre-Revolution days a ukase emanated either from the tsar or from the senate. Whether legislative or administrative in import, it had the binding effect of law until annulled by a later ukase, and the collection of these edicts formerly made up the legal code of Russia. The term was revived by the Soviet authorities in 1938.

Ukraine. European republic of the U.S.S.R. Historically the land of the Little Russians, Ukrainians, or Ruthenes, it is said to be traceable as a state with its capital at the holy city of Kiev in the 9th century. This state passed under Lithuanian and Polish authority, and by the treaty of Andrusowo, 1667, that part E. of the Dnieper was ceded to Russia; which absorbed the rest in 1793 at the second partition of Poland. In 1917 a Ukrainian people's republic was founded; this was joined at the end of the First Great War by Austrian Ukraine (Galicia); and in 1920 a Soviet republic was proclaimed through the combined territory, recognized in the treaty of Riga by Russia and Poland. Throughout this period there was fierce and confused fighting between tsarist Russians, Bolsheviks, Germans, and Poles.

When on July 6, 1923, the constitution of the U.S.S.R. was adopted, Ukraine became the second largest republic in the union (later exceeded in area by Kazakh S.S.R.). A western portion which had been conquered by Poland in 1919-20 was regained by the U.S.S.R. in Sept., 1939, and incorporated on Nov. 1. In 1940 Rumania ceded N. Bukowina and her Bessarabian provs., confirmed in the peace treaty of 1947; and in 1945 the parts of Ruthenia formerly within Czecho-Slovakia and Poland were taken over, the Rumanian portion in 1947. Distribution of these territories between Ukraine and Moldavia S.S.R. (the second had been until 1940 a dependency of the first), was left to these two republics. In 1946 Ukraine covered about 225,000 sq. m. and its pop. was close on 40 millions.

The republic is bounded S. by the Sea of Azov and Black Sea; S.W. by Moldavia S.S.R., Rumania, Hungary, and Czecho-Slovakia; W. by Poland; N. by White Russia S.S.R.; E. by the D.S.F.S.R. Its great river is the Dnieper, others being the Bug,

Donetz, and Dniester. There were 25 regions or provinces in 1946. Kiev is the capital, and like Kharkov had more than 800,000 inhabitants in 1939, when they were the third and fourth cities of Russia. Odessa and Dnepropetrovsk claim more than half a million each.

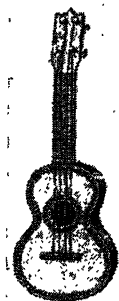
In both agriculture and industry Ukraine is outstanding. In view of the devastation brought about by invaders and defenders alike in the Second Great War (see Russo-German Campaigns), post-war figures of production are misleading. But some of the richest land in Europe yields wheat, rye, barley, oats, buckwheat, sugar-beet, potatoes, cotton, and flax; before the war nine-tenths of Russia's exported cereals came from Ukraine. More than half the cultivated land is arable, collective farms being nearly ten times as numerous as state farms. Horses, cattle, sheep, pigs, and goats are reared. Forests cover 13,000 sq. m.

Half Russia's reserves of bituminous and anthracite coal are in the Donetz basin, and this coal combined with iron ore from around Krivoi Rog has given rise to a vast industry in steel, pig-iron, and foundry and furnace products. Manganese, aluminium, oil, salt, and gypsum occur. Chemicals and machinery are made. Hydro-electric installations on the Dnieper serve thousands of communities. There are 9,000 m. of rlys.

Kharkov, Kiev, Odessa, and Uzhgorod (Ungvar) have universities, and there are training colleges and schools for those who speak Ukrainian, Moldavian, Polish, and Yiddish, as well as Russian. Greek Orthodox and R.C. churches attract the biggest congregations. It is claimed that Russian literature of the 11th-13th centuries was Ukrainian, and certainly there was a nationalist school of writers by the 16th century. Later names are Ivan Kotlyarevsky (1769-1838) and Taras Shevchenko (1814-61). Karol Szymanowski (1883-1937) is the principal Ukrainian composer, though regarded as a Polish artist. See Dnieper; Dnieper Dam; Dniester; Donetz Basin; Galicia; Kharkov; Kiev; Russia; Ruthenia.

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Ukulele or **UKELELE**. Musical instrument of the guitar family. It has a long finger board and four



Ukulele. Musical instrument of Portuguese origin

strings which are plucked in chords to provide a simple tinkling accompaniment to popular songs. Originating in Portugal, it entered the world of popular entertainment in the U.S.A. by way of the dance band and vaudeville, in the early 20th century after the banjo had outworn its first welcome; and was later adopted as a solo instrument by occasional music-hall artists in America and Great Britain, besides having a certain vogue among amateur performers.

Ulan Bator or **URGA**. Chief town of Outer Mongolia, China. It is about 730 m. N.W. of Peiping and 170 m. S. of Kyakhta in the U.S.S.R., and stands on a tributary of the Tola. There is considerable trade in the products of cattle, sheep, and horses. A holy city, Ulan Bator is the residence of the Jetsun Dampa Hutuktu, who ranks as third Buddha in the Lamaist hierarchy. Hither the Dalai Lama withdrew from Tibet

Ulan Ude or **VERKINE UDINSK**. Chief town of the Buriat-Mongol (q.v.) republic, U.S.S.R. It stands S.E. of Lake Baikal and is connected by the Trans-Siberian rly. with Irkutsk, about 160 m. direct W. on the other side of the lake.

Ulcer. Breach on the surface of the skin or mucous membrane which does not tend to heal quickly. It discharges its contents quickly, whereas an abscess does not. An ulcer may be due to a simple localised infection, or to constitutional disease such as syphilis or tuberculosis, or may arise in the course of malignant disease, or may be due to sluggishness of the circulation in the veins. Chronic ulcers require local treatment. Rest is not always prescribed. See Duodenum; Gastric Ulcer.

Uleåborg. Swedish name for the district and seaport of Finland, called in Finnish Oulu (q.v.).

Ulex. Small genus of spiny shrubs of the family Leguminosae. They are natives of W. Europe and N.W. Africa. As seedlings they have a few normal leaves divided into three leaflets; but later leaves are all metamorphosed into needle-pointed spines. The larger spines are aborted shoots, as many show by bearing flowers. See Furze.

Uliasutai. Town of Outer Mongolia, China. It stands S. of the Khangai range, at the junction of



Ullswater. A pleasure steamer arriving at Pooley Bridge on this lake of Cumberland and Westmorland. See facing page

after the Younghusband expedition. The Hutuktu proclaimed his independence of China when the republic was set up in 1911, but in 1915 he accepted autonomy in recognition of Chinese suzerainty. A Mongol burial ground probably of the 2nd cent. B.C. was unearthed in 1925. In the Mongol quarter live several thousand monks; the Chinese town is a few miles away. There is a university with 600 students and a partly Russian teaching staff. Pop. approx. 100,000.

the Uliasutai and Bogdo rivers, this site making it a mart and the centre of a trade in cattle.

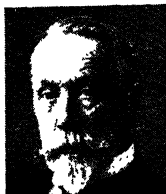
Ullage. That part of the volume of a vessel not filled with liquid. Measurement of the contents of a calibrated tank may be made directly by finding the depth of liquid (dipping) or indirectly by finding the amount of free space (ullaging) and subtracting this from the capacity of the tank. Ullaging is usual in rail cars, tankers, and wherever obstructions

make dipping impossible. The reference point from which the depth to the top of the liquid is measured must be rigidly fixed.

Ullapool. Town of Ross and Cromarty, Scotland. Established in 1788 by the British Fisheries Association, it is 36 m. N.W. of Dingwall, and has a good harbour on Loch Broom and several attractive whitewashed houses. The district attracts geologists, anglers, and holiday-makers.

Ullswater. Lake in the counties of Cumberland and Westmorland, England. Lying 4 m. S.W. of Penrith, this is the second largest of the English lakes, with a total length of $7\frac{1}{2}$ m., average width of $\frac{1}{2}$ m., and depth of 477 ft. The lake is divided into three reaches, of which the southern is set in some of the most beautiful of the Lake scenery. See Lake District.

Ullswater, JAMES WILLIAM LOWTHER, 1ST VISCOUNT (1855-1949). British politician. Born



1st Viscount
Ullswater,
British politician

April 1, 1855, he went to Eton and Trinity College, Cambridge. Entering politics in 1883 as Conservative M.P. for Rutland, he represented Penrith continuously from 1886,

and was Speaker of the house of commons from 1905, until raised to the peerage in 1921. Lowther was one of the most distinguished of all Speakers, acquitting himself with dignity during the suffragette period. He presided over the electoral reform conference of 1916, the committee on proportional representation 1918, and the lords and commons committee on electoral reform 1929. He wrote *A Speaker's Commentaries*, 1925. Dying March 27, 1949, he was succeeded by his great-grandson Nicholas (b. 1942).

Ulm. Town of Germany, in Württemberg-Baden. At the confluence of the Iller and the Blau with the Danube, 46 m. direct and 58 m. by rly. S.E. of Stuttgart, it is joined with New Ulm in Bavaria by two bridges across the Danube, which here becomes navigable. During the Second Great War, before it was captured by the U.S. 7th and French 1st armies on April 24, 1945, it was destroyed by heavy Allied bombing except for the Protestant cathedral, founded in 1377, which, however, was badly



Ulm, Germany. Approach to the 14th century Gothic cathedral, as it was seen by U.S. troops, after the capture of the town in 1945

damaged. Famous for its great size and its high tower, which, finished in 1890 with other work of restoration, is at 528 ft. the loftiest ecclesiastical structure in Europe, it had fine stained glass and carving. The 18th century town hall had remains of ancient frescoes. Brass-founding, bleaching, brewing, and leather working were long established industries; and hats, wire rope, cement, and paints were made. A town since 1027 and later the chief place in Swabia, Ulm was a free imperial city in the 14th and 15th cents., was annexed to Bavaria in 1803, and to Württemberg in 1809. After the Second Great War it fell in the U.S. zone of occupation. Pop. 64,000.

Ulm, CAMPAIGN OF. French success over the Austrians in 1805. The adhesion of Francis I to the third coalition involved Napoleon in war with Austria simultaneously with England and Russia. The Austrian forces under Mack, instead of awaiting the arrival of the Russians, had taken up a position between Ulm and Memmingen, and in Sept. Napoleon formed the plan of cutting Mack off from his allies and Vienna. To this end he passed all his armies, aggregating 190,000 men, swiftly through Hanover and the smaller German states, and reached the Danube in rear of Mack, who was taken by surprise. Napoleon succeeded in hemming in Mack with

60,000 men at Ulm, the investment being completed on Oct. 14 and the surrender on Oct. 20—one day before Trafalgar.

Ulmaceae. Botanical name for the elm family, which contains trees and shrubs, natives chiefly of the northern regions. They have rough, alternate leaves, and greenish flowers in loose clusters. The family is divided into two suborders, Celtideae and Ulmeae. The former includes the genus *Celtis*, containing the nettle tree (*q.v.*), the latter *Ulmus* and *Planera* or Water Elm. The elms are mostly very large trees with rough bark; the timber is esteemed for its resistance to the action of water. The inner bark of the European *U. campestris* has tonic and diuretic properties, and is used as a medicine for skin diseases; that of the N. American *U. fulva* is used as a demulcent, internally and externally. When ground it makes a poultice similar to linseed-meal.

Ulna. Internal of the two long bones of the forearm. In its upper part it articulates with the humerus, or bone of the upper arm, and radius, or outer bone of the forearm. In the lower part it articulates with the radius and with a fibro-cartilage which separates it from the wrist-joint. The upper part terminates in a projection known as the olecranon, which forms the point of the elbow. The curved surface which articulates with the humerus is known as the great sigmoid cavity, terminating above in the olecranon and below in a projection, the coronoid process. On the outer side of the base of the coronoid process is the small sigmoid cavity which receives the head of the radius.

Ulnar Nerve. One of the main nerves of the arm. It arises from the brachial plexus in the outer wall of the armpit, and passes down on the inner side of the arm, being felt as the "funny bone" just inside the internal condyle of the humerus. The nerve terminates below the wrist, where it divides into numerous branches for the supply of the skin and muscles of the hand.

Ulphilas OR WULFILA (c. 311-383). Gothic evangelist and translator. Said to have been the son of Cappadocian captives, he was born in Gothic territory N. of the Danube and was sent as a youth to Constantinople, where he learnt Latin and Greek. Early in life he became a lector or reader of the Scriptures, and in 341 he was consecrated bishop of the West Goths by Eusebius of Nicomedia. For



Ulster. Map of the ancient northern province of Ireland, within which are the Six Counties forming Northern Ireland

seven years he laboured successfully as a missionary N. of the Danube, preaching the Arian doctrines, to which he adhered all his life. In 343 a persecution of the Christians compelled him to migrate with his flock, and with the consent of the Emperor Constantine they settled in Lower Moesia, near Nikopolis. Here Ulphilas continued his work as missionary for 33 years.

His translation of the Bible, of which there are extant large portions of the four Gospels, the whole of S. Paul's second Epistle to the Corinthians, and fragments of other books, is almost the only written document of the Gothic language, and the oldest existing work in a Teutonic tongue. It is contained in six different manuscripts all dating from the first half of the 6th century, of which the most important is the Codex Argenteus, preserved in the library of the university of Uppsala.

Ulster. Most N. of the four historic provs. of Ireland. It consisted of the cos. of Donegal, Londonderry, Antrim, Tyrone, Cavan, Fermanagh, Monaghan, Armagh, and Down; area, 8,613 sq. m. Six Ulster counties, i.e. all save Donegal, Cavan, and Monaghan, form the country known since 1920 as Northern Ireland, which, as a partly self-governing unit within the U.K., is described separately in this work.

The early history of the province of Ulster is largely one of tribal wars, but it appears to have been a kingdom, and in the 12th century was conquered by the English. It

was divided into shires about 1580, and its plantation by English and Scottish settlers was promoted under Elizabeth and James I. Afterwards land was given to many of Cromwell's soldiers, and in these ways a large number of Scottish and English settlers were introduced. The largest city is Belfast. Much flax is grown, and the making of linen is a staple industry. The area around Belfast is industrial; agriculture is followed in other parts of the prov.

Early in the 12th century the English king created an earldom of Ulster. This was held by the family of Lacy, and later by that of de Burgh, from whom it passed by marriage to Lionel, duke of Clarence.

The presence in Ulster of two distinct races, the Irish and the descendants of settlers from Scotland and England, together with religious antagonisms, presented a formidable difficulty when the demand for Irish home rule became insistent. Details of the events arising from these difficulties will be found under Ireland. Each of the cos. making up the province is described separately.

Ulster Constabulary, ROYAL. Irish police force. On the establishment of the govt. of Northern Ireland (q.v.) in 1921, the Royal Irish Constabulary (which had been formed in 1867) was disbanded, and the R.U.C. formed to police the six northern counties, many former members of the R.I.C. agreeing to serve as a nucleus. Chief of the force—which totals some 2,900—is an inspector-

general under whom are a deputy inspector-general, a commissioner of police in charge of the force in Belfast, and six county inspectors. The h.q. is in Belfast. The counties are sub-divided into districts, each with a district inspector, and into sub-districts each with a sergeant. Police barracks in each sub-district provide living accommodation for single men. See Police.

Ulster King of Arms. Chief heraldic officer, 1552-1943, in Ireland. The office, instituted by Edward VI in substitution for the dignity of Ireland king of arms instituted by Richard II, was terminated March 31, 1943. Its functions in Eire were taken over by the Irish Genealogical Office, Dublin Castle, and in N. Ireland by Norroy and Ulster king of arms.

Ulster Rifles, ROYAL. Regiment of the British army. Raised in 1793 as the 83rd and 86th Foot, the regiment was recruited mainly from N. Ireland, and was drafted to the W. Indies, where it won its first battle honour, San Domingo. In 1801 it was with Abercromby at the capture of Cairo; next it served in the Second Maharratta War in India, and was at the capture of the Cape of Good Hope, 1806. From Africa the regiment moved to Spain, where it joined the Light division and gained 12 honours in the Peninsular War. During the Indian Mutiny, 1857, the 2nd battalion particularly distinguished itself.

In 1881 the 83rd and 86th Foot became the 1st and 2nd battalions of the Royal Irish Rifles, and as such served throughout the S. African War. Twenty-two battalions were raised in the First Great War and gained the battle honours: Mons; Marne, 1914; Ypres, 1914, '15, '17, '18; Neuve Chapelle; Somme, 1916, '18; Albert, 1916; Courtrai; Struma; Suva; Jerusalem. The regiment provided the nine infantry battalions of the Ulster division. After the formation of the Irish Free State in 1922 the unit took its present title. In the Second Great War it became lorry-borne infantry, battalions serving in all the major campaigns. The regimental depot is at Omagh, Tyrone.

Ultima Thule. Term signifying the extreme limit. See Thule.

Ultimatum (Lat. *ulimus*, last). Final terms or conditions presented after inconclusive negotia-



Royal Ulster Rifles badge

tions by one party in a dispute to another, usually with a time-limit for acceptance or rejection. An ultimatum may be given in order to put an end to delaying tactics on the part of an opponent, or may offer terms impossible of acceptance, and so lead to war. The entries of various belligerents into both Great Wars followed a series of ultimatums.

Ultor (Lat., avenger). In Roman mythology, an epithet of Mars, the god of war. The temple built at Rome by Augustus after the defeat of Caesar's murderers was dedicated to Mars Ulder.

Ultrabasic Rocks. In geology, a classification group of igneous rocks which are poor in silica and alkali content, but rich in magnesia, lime, and iron oxides. They include types like peridotite, serpentine, and dunite, which are characterised by such minerals as olivine, pyroxene, amphibole, etc., to the exclusion of quartz and feldspars. Chromite, iron, platinum, and diamonds are locally associated with these rocks. *See* Igneous Rocks; Rock.

Ultra-Centrifuge. Device for separating particles of different sizes or densities, or the constituents of mixtures of gases or liquids with different densities. The system under test is contained within a cylinder rotated at a high speed, e.g. by compressed air, and centrifugal force will tend to cause the more dense particles to move outwards. The device has been used with some success to separate isotopes.

Ultra-High Frequency. Term which refers to electro-magnetic radiation of the order of 1,000 Mc/s., i.e. 10^8 cycles per sec., when the wavelength will be in the centimetre region.

Ultramarine (Lat. *ultra*, beyond; *mare*, sea). Blue pigment originally obtained by grinding up lapis lazuli. This method made cost of the pigment very high, and it is now artificially prepared by heating together clay, sodium carbonate, and sulphur. It was first produced commercially in 1828. Exact composition of the native mineral is not known.

Ultra-Microscope. Device for viewing small particles which are not visible under the ordinary microscope. A powerful beam of light is focused in the liquid under examination, and any suspended particles present will appear as bright points, acting as scattering elements to the light. This phenomenon is known as the Tyndall effect.

Ultramontane (Lat. *ultra*, beyond; *montanus*, pertaining to mountains). In general, term applicable to things on the farther side of mts., and in practice referring to the Alps; it is thus a term relative to the geographical position of those using it. In common usage Ultramontane designates that element in the R.C. Church which lays special stress on the absolute supremacy of the pope in matters of faith and ecclesiastical discipline, opposing the idea of national churches, such as the Gallican, which are conceived as partially independent of the Holy See. The term became familiar to the British public at the time of the Vatican council, 1869-1870, when controversy arose between Gladstone and Manning on the subject of papal authority. The extreme ultramontane view, which would have extended infallibility even to the utterances of the pope as a private individual, was rejected by that council. In 19th century France, Germany, and Austria the Ultramontanes formed strong groups in party politics. *See* Kulturkampf; Vatican Council.

Ultrasonics. Branch of physics concerned with the generation and effects of waves of a special class. These waves are propagated in air, liquids, and solids; they differ from ordinary sound waves in having frequencies too high for the human ear. Their range of frequencies extends from 20,000 to 2,000,000 cycles per sec. They are not electro-magnetic waves, but are made up of successive compressions and rarefactions; their speed in air is like that of sound.

Methods of generating such waves include one using the piezo-electric crystal driven by a valve oscillator; another working on the magnetostriction principle. In the piezo-electric generator very high frequencies can be reached, but the power available is comparatively small. The magnetostriction method is more promising. It permits a relatively high power output to be obtained, but the frequency range is very limited and the generator becomes very hot. Many physicists hold that neither of these methods can be developed sufficiently to exploit ultrasonic waves to the full. Other methods have therefore been investigated.

Ultrasonic waves can be used for many purposes. Results obtained in the dairy industry show that ultrasonic treatment is one of the most effective methods of milk

sterilisation. No other method kills all bacteria, and most have some effect on the quality of the milk.

Another application is the testing of such things as castings or aeroplane propellers for internal defects. In the past it was necessary to break up a percentage of each batch made. This was expensive and not conclusive, for there might always be faults in those not tested. X-ray examination was a step forward, since it allowed every article to be examined without the need to destroy any. The apparatus is, however, costly and not easy to use. Ultrasonics provide a much cheaper and simpler, but equally effective means, which works similarly to radar. A pulse of ultrasonic vibrations is sent through the article and is normally reflected back from the far side to a receiver. The time which the pulse should take for its double journey through the material is readily calculated. If there is a hidden flaw the pulse is reflected back from this, and makes the journey more quickly. Similarly hidden faults in the concrete runways of aerodromes, or those ahead of the working face in mines can be detected. A further advance, also on radar lines, is the focusing of ultrasonic waves into a beam by a parabolic reflector. In this way a short range navigating device has been evolved.

Ultrasonic waves applied to liquids have thrown new light on molecular structure. At some frequencies the phenomenon of cavitation has been observed. Remarkable results have also been achieved in the removal of dirt from fabrics. Without the use of soap, fabrics impregnated with dirt are thoroughly cleaned by immersing them in hot water agitated by ultrasonic vibrations. The particles of dirt are literally shaken out of the material, though if the frequency is too high the material itself may be shaken to pieces.

Ultra-Violet Radiation. Term applied to light radiations of a wavelength shorter than those of the visible range of the spectrum. In Ångström units (Å) they range approximately from 3,900 Å, the limit of visible light at the violet end of the spectrum, to 1,000 Å, the beginning of the X-rays. Ultra-violet rays obey the same laws of reflection, refraction, etc., as does ordinary light, and can be focused by a concave mirror or a lens. The whole range affects photographic plates, and the ultra-violet part of the solar spectrum

has beneficial and tanning effects on the skin, though this is probably due to a very small range of wavelengths. Such rays may be artificially produced by mercury vapour lamps and tungsten arcs. Ultra-violet radiation has been used to restore to pasteurised milk the vitamin A destroyed by the process of pasteurisation. See Ray Therapy.

Ultra Vires (Lat., beyond the powers). Legal phrase used in connexion with the law of corporations. In Great Britain and the U.S.A. all corporations (this word includes limited companies) are constituted by a document—for a limited company the memorandum of association—which defines its powers. A corporation has only the powers actually set out in this document, and any powers necessarily incident thereto. If the directors of a corporation do, in the corporation's name, any act, or enter into any contract not within these powers, they are acting *ultra vires*, and the corporation is not bound thereby.

Ulundi. Village of Zululand, S. Africa, now in Natal. It is 115 m. N. of Durban, and was the headquarters of Cetwayo and other Zulu kings, the word meaning high place. Here on July 4, 1879, the Zulus were decisively defeated by a British force under Lord Chelmsford. The force, consisting of about 4,200 Europeans and 1,000 natives, received the attack of about 20,000 Zulus. Met with a tremendous fusillade, the enemy eventually broke in confusion. The Zulus lost 1,500, the British casualties being about 100.

Ulverston. Urban district, market town, and administrative centre of the Furness district of Lancashire, England. Situated on Morecambe Bay, near the mouth of the Leven, 26 m. N.W. of Lancaster, it has a rly. station. The parish church of S. Mary was founded early in the 12th century, but the present structure is of Tudor date. The town makes clothing, chemicals, electrical accessories, and has tanning and light engineering works. Before the rise of Barrow it was the chief town in Furness, its fair and market dating from the 13th century. Market day, Thurs. Pop. 26,910.

Ulyanov. Surname of the Bolshevik leader who rose to fame as Lenin (*q.v.*).

Ulyanovsk. A town of the R.S.F.S.R., in the region of the same name. Formerly Simbirsk, birthplace of Lenin, whose real name was Ulyanov, it was renamed

in his honour. It is built on a hill, alt. 560 ft., on the right bank of the Volga; lies 110 m. S. by W. of Kazan; and has rly. communication with Ufa. Impressive buildings are the cathedral dedicated to S. Nicolas in 1712, and the convent of the Redeemer, 1648 (the year of the town's foundation). Ulyanovsk trades in grain and potash, engages in river fishing, and has saw-mills, brickyards and distilleries. Pop. of town, 102,106.

Ulysses. Latin form of the name of the Greek adventurer Odysseus (*q.v.*). He is equally familiar in this form in English literature. He appears as a leading character in Shakespeare's *Troilus and Cressida*, and gives the title to a poetic drama by Stephen Phillips, produced in 1902 at His Majesty's Theatre, London, and to a fine poem by Tennyson in which the wanderer is speaking as an old man. James Joyce's book is separately noticed.

Ulysses. Novel by James Joyce (*q.v.*). It has been described as the revelation of all life in a single day. The action covers the period from early morning of June 16 to about 3 a.m. of June 17, 1904. Into this is packed a picture of the variegated Dublin life which serves as a background for the chief characters, the poet Stephen Dedalus, and Leopold Bloom, an Irish Jew. The construction is based on the *Odyssey* of Homer. The partly autobiographical figure of Dedalus (Telemachus) represents the fatherless son, whereas Bloom (Ulysses) stands for the sonless father. Begun before the First Great War and completed 1920, the book was published in Paris and London, 1922. Its frankness and free use of obscene words caused it to remain unprinted for many years in Great Britain and the U.S.A., but it appeared in unexpurgated form in 1934. Of 732 pages, *Ulysses* is the supreme example of the "stream of consciousness" style of writing, and had a profound effect upon contemporary British, French, and American writers. Consult *Ulysses*, S. Gilbert, 1930; *Fabulous Voyager*, R. M. Kain, 1947.

Uma. In Hindu mythology, one of the names under which the wife of Siva is worshipped. See *Devi*.

Uman. Town of Ukraine S.S.R. It is in the region of Kiev and about 115 m. S. of that city, being on a tributary of the Bug, and the terminus of a branch rly. Pop. approx. 50,000.

Umballa. Another spelling of Ambala (*q.v.*), in Punjab, India.

Umbel (Lat. *umbella*, a screen). Form of inflorescence in which all the footstalks of a cluster of flowers radiate from a common point at the top of the flower stem. See *Coriander*; *Inflorescence*; *Sanicle*.

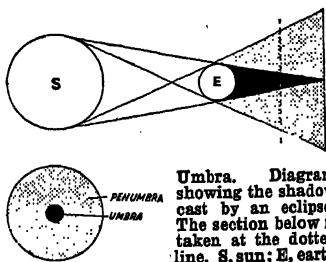
Umbelliferae. An extensive family of herbs. Chiefly natives of Europe, N. and W. Asia, N. Africa, and N. America, they have jointed stems, the lengths between the nodes being usually hollow. The alternate leaves are occasionally undivided, but mostly much dissected, the leaf-stalk dilated at the base and clasping the stem. The flowers are small, usually white, but some species are yellow, pink, or blue; they are associated in umbels and these often form compound umbels. The fruit consists of two flattened carpels which have five or nine ridges on their outer face, and are often traversed by canals filled with pungent oils, which cause many species to be useful in medicine, cookery, etc. Some species are poisonous, e.g. hemlock (*Conium*), cowbane (*Cicuta*), and waterdropwort (*Oenanthe*).

Umbra (Lat. *umbra*, shadow). Mineral pigment, a hydrated ferric and manganese oxide mixed with variable proportions of earthy matter. It is brown in colour, and is found in Cyprus and other localities. The pigment is used both raw and burnt or calcined. In the latter form it has a redder, warmer colour than the former.

Umberto. For the two kings of Italy who bore this name see under *Humbert*.

Umbilical Cord (Lat. *umbilicus*, navel). Cord, containing two arteries and a vein, which unites the infant in the womb with the placenta or mass of tissue adherent to the womb. The embryo absorbs fluids and nutriment from the mother's blood, borne to and from the placenta by the vessels of the umbilical cord.

Umbra (Lat., shadow). In astronomy, word used in two senses: (1) The darkest portion of the



shadow cast by the earth on the moon or the moon on the earth. It is surrounded by the penumbra. (2) Dark central region of a sunspot.

Umbrella (Lat. *umbra*, shade). Instrument carried for protection against rain or sun; when used for the latter purpose it is commonly termed a sunshade or parasol. It is made of silk, cotton, paper, etc., stretched on a steel or wooden radiating, folding frame, supported on a rod. Umbrellas were known in England in the 17th century, but their use does not appear to have been general until the latter part of the 18th century.

Jonas Hanway (*q.v.*) was one of the first to make a habit of carrying one. By the invention of the "Paragon" ribs, Samuel Fox in 1852 improved upon the old umbrellas with wooden ribs, and did much to stimulate the trade of umbrella making, important centres of which are London, Manchester, Paris, Lyons, and Angers.

In the East, umbrellas were used as symbols of royalty and power from early times. In ancient Egypt and Nineveh sculptured remains show them carried in procession, and they are found pictured on Greek vases. Anglo-Saxon MSS. show them carried by attendants over persons of rank. The Mahratta princes of India were known as Lords of the Umbrella, and in Burma white umbrellas were reserved for the use of the king and the sacred white elephant; coloured ones, graduated according to their tint, belonged to corresponding grades in rank.

Umbrella Tree (*Magnolia tripetala*). Small tree of the family Magnoliaceae, native of N. America. Its oval-lance-shaped leaves are one to two ft. long, crowded at the summit of the flowering branches in an umbrella-like circle. The large white flowers are slightly scented.

Umbria. A region of central Italy. Covering the provs. of Perugia and Terni, it has an area of 3,271 sq. m., and pop. est. 780,000. Medieval castles and bridges abound, Umbria losing less than any other of the Italian depts. fought over in the Second Great War. Ancient Umbria extended more to the E. than the modern prov., and touched the Adriatic



Umbrella of 750 B.C., from an Assyrian bas-relief. Top, Nigerian state umbrella

coast. The people were akin to the Oscans and Latins. They were defeated by Rome in 308 B.C., and finally conquered at the battle of Sentinum in 295 B.C. See Eugubine Tables; Foligno; Perugia; Rome; Terni.

Umea. River and port of N. Sweden. The river rises in the

Kjölen Mts. and flows through several lake expansions S.E. to the Gulf of Bothnia after a course of about 250 m. The small port of Umeå, capital of the co. of Vesterbotten, is 12 m. from the mouth of the river. It is on a branch rly., and exports timber, wood-pulp, and tar. Pop. 14,092.

Umlaut (Ger. *um*, round; *laut*, sound). Term invented by the German philologist, J. Grimm, for the modification, especially characteristic of the Teutonic family, of an accented vowel by the vowel *i* or semi-vowel *j*, which originally stood in the succeeding syllable. It is expressed in German writing and print by the symbol " (commonly called an *umlaut*) above the vowel of the affected syllable or by the insertion after that vowel of the vowel *e*. Examples are Ger. *Männer*, *Mäuse* (pl. of *Mann*, *Maus*) and English men, mice. See Philology. *Pron.* oomlowt.

Umpire. Person appointed to arbitrate or decide between two opposing parties. If several arbitrators disagree, an umpire is called in to settle the dispute. The term is used in various sports, notably in cricket. A cricket match requires two umpires not appointed by the teams, one standing at the wicket at the bowler's end, the other being square to the striker. The word was originally *nompere*, the change being similar to that in *apron* (*q.v.*). It is derived from Old Fr. *non*, not; and *per*, peer, equal. See Arbitration; Referee.

Umtali. Mining and agricultural centre in the British portion of Manicaland, S. Rhodesia. It is 171 m. by rly. S.E. of Salisbury. Here are the workshops of the Beira-Mashonaland rly. Gold, silver, lead, and copper are mined. With a magnificent climate and situation, alt. 3,750 ft., Umtali grows cereals and tobacco. There are European and native hospitals. Pop. (white) 3,300.

Una. Heroine of the first book of Spenser's Faerie Queene. She is the personification of truth, and having sought at the court of Gloriana (Queen Elizabeth) a champion to slay the dragon which keeps her parents prisoner, secures the aid of the Red Cross Knight. They set forth together, but get separated by the magic of Archimago, after which Una for a time is accompanied by a lion. See Faerie Queene.

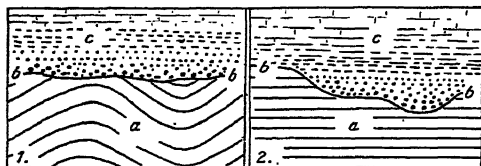
Unalaska. Second in size and chief in importance of the Aleutian Islands (*q.v.*), Alaska. A mountainous and barren island, it measures about 76 m. in length and varies in breadth from 10 m. to 24 m. It has deeply indented coasts and contains the volcano of Makushin, 5,635 ft. high. Iliuliuk or Unalaska, a port of entry on the N. coast, is the chief settlement. Here also is the U.S. naval base, Dutch Harbour.

Unanimism. French literary movement initiated in 1909 by Jules Romains (*q.v.*). It advocated world brotherhood, under the influence of Whitman and Verhaeren. The central doctrine of the *Unanimes* was the subordination to the group of the individual, whose true development was held to lie in merging his own with the larger interest. In its socialistic tendencies the movement was opposed to traditionalism; in its clarity and directness, it was a reaction against symbolism. Blank verse was the chosen medium. Georges Duhamel (*q.v.*) was one of the early Unanimes.

Unao. District and town of the Uttar union, India, in the Lucknow division. The dist. is separated from that of Cawnpore by the Ganges and adjoins the Lucknow dist. on the N.E. The annual rainfall is 35 ins. Wheat, barley, and sugar-cane are the chief crops. The town, a rly. and road junction between Cawnpore and Lucknow, contains many Hindu temples and mosques. Area, 1,762 sq. m. Pop., dist., 959,542; town, 12,700.

Uncial (Lat. *uncia*, an inch). Ancient style of writing in capital letters. Derived from an expression of S. Jerome's, the term denotes the rounder and less regular

characters resulting from the adaptation of stone-incised capitals to vellum writing. See Alphabet; Capitals; Palaeography.



Unconformity. Diagram 1. Angular unconformity. 2. Erosional unconformity. a, older beds which have been eroded; b, surface of unconformity; c, younger beds

Uncle Remus. Book by the American writer Joel Chandler Harris (*q.v.*), consisting of stories about Br'er Rabbit and Br'er Fox, as related by an imaginary negro, Uncle Remus. Harris himself came to be called by the same name.

Uncle Sam. Nickname used to personify the government or people of the U.S.A. It appears to have arisen in the war against Great Britain, 1812-14, and may have been a jocular misinterpretation of the letters U.S. See Brother Jonathan.

Uncle Toby. Character in Sterne's *Tristram Shandy* (*q.v.*). Uncle of the narrator of the story, and the embodiment of simple, kindly common sense, he is an old soldier, fond of fighting his battles over again. His favourite tune was Lilliburlero, which he whistled under his breath in moments of stress.

Uncle Tom's Cabin. Story dealing with slavery in America by Harriet Beecher Stowe (*q.v.*). After appearing serially in the anti-slavery journal, *The National Era*, the story was published in vol. form in 1852, and had extraordinary success. Although the book occupies an important position in the history of the abolitionist movement, it has little literary value, the characterisation being crude and the style undistinguished. Besides Uncle Tom the characters include the slave-driver Legree and the white girl Eva, with her slave attendant Topsy.

Uncommercial Traveller. THE. Miscellaneous descriptive papers and sketches by Dickens, contributed to *All the Year Round* and first collected under this title in 1860, and later added to up to 1869. The title presents the author as travelling for the great house of Human Interest, Brothers.

Unconformity. In geology, a break accompanied by erosion in the deposition of strata. Angular unconformities are formed when rocks of an old series have been

tilted or folded, eroded to a smooth or undulating surface, and then had a younger group of beds deposited on their truncated edges.

Erosional unconformities are the result of more simple earth movements by which the older beds have not been tilted, but simply raised and eroded; so that when the younger overlying deposits are laid down on them the stratification planes are parallel despite the break that occurs between the two groups. The plane of unconformity may be an old land surface or a plane of marine denudation. See Sedimentary Rocks.

Unconscious. Psychological term for regions of the mind normally inaccessible to consciousness. Until the end of the 18th century, mind was generally equated with consciousness, though it was realized that something must happen to those memories, feelings, and desires which are not within the focus of attention at any given moment. Later these were all regarded as sub-conscious. Freud first postulated that many impulses, and some memories, feelings, etc., are not only sub-conscious, but never do or can become known to the ego in their original form unless they are brought to the surface by hypnosis or free association. He therefore divided the subconscious into the pre-conscious, whose contents are subject to voluntary recall, and the unconscious, which is barred from attention by the super-ego. He went on to show that although their existence is denied by their owner, they frequently exercise a lifelong influence upon his behaviour and beliefs.

Briefly, a child is born with an equipment of inherited instinctive urges which demand satisfaction. Some, like hunger, must be frankly admitted. Others, like the desire to kill people who annoy him, and many manifestations of the sexual instinct, begin to arouse guilt, shame, and anxiety which increases as the child accepts a degree of moral training. When these feelings become acute the mind represses, or drives into the unconscious, everything which roused them. After this no more direct knowledge is possible, for the super-ego continues to keep them out of consciousness. But whenever an external situation must be faced

which resembles that which caused the original repression, the exiled material strives to return to the conscious mind. Symbols, errors and omissions, the material of dreams, works of art in which free rein is given to the imagination, may all express unconscious wishes and conflicts. People with a large accumulation of repressed anxiety will feel exaggerated dread of small dangers which normal minds can meet with equanimity. Sometimes these fears amount to phobias.

The contents of the unconscious are not organized like those of the conscious mind. They seem—to use a spatial metaphor—to lie side by side without modifying one another. The only link between them is that, where a series of repressions takes place at various moments in life on account of the same type of prohibition, all will be aroused by a fresh stimulus of the same general nature. The unconscious exhibits no mechanisms of its own except this persevering though intermittent struggle against frustration and oblivion. As it cannot be attended to, the material which becomes unconscious is not amenable to reason, which might free the conscious personality from its influence.

Amber Blanco White

Unconsciousness. Insensibility to the surroundings. Unconsciousness, apart from sleep, may be due to simple fainting; injury to or disease of the brain, such as concussion or apoplexy; epilepsy, diabetes, uraemia, and other constitutional conditions; hysteria; or poisoning by various narcotics. In all cases of sudden unconsciousness, the patient should be kept in the recumbent posture, with the head low if the face is pale and the breathing shallow, or high if the face is congested and the breathing stertorous. Clothing round the neck and chest should be loosened, and artificial respiration should be adopted if breathing shows signs of failure. Further treatment depends upon the underlying cause mentioned above.

Undercooling. Phenomenon in physics also known as Supercooling (*q.v.*).

Underground Dwellings. The natural and artificial cavities in the earth used for residence, refuge, storage, and burial. The primal cave-dwelling, often retained in later phases of civilization, survives in special circumstances in the modern world, e.g. in caves used as air-raid shelters during the Second Great War. In Neolithic times men began to sink the foundations of

structures for domestic and industrial purposes. The practice was perpetuated by the early Germanic tribes. Such semi-subterranean dwellings survive in N. Asia, among the Eskimos and the Pacific coast Indians, as well as in Central and South Africa. The megalithic builders, whose massive stone monuments were devised primarily for the tendance of the dead, developed also a laborious practice of rock-cutting.

In the Balearic Islands there are underground villages, faced with massive blocks. In S. Palestine a non-Semitic people excavated limestone labyrinths, one with 60 chambers, another with a chamber 400 ft. long, 80 ft. high. At Edrei, the city of Og, king of Bashan, a vast subterranean city was in a later age carved out of lava, with streets, shops, houses, market-place, and a pillared hall roofed with a jasper monolith. There are many other widely scattered examples. See Archaeology; Cave Dwellings.

Underground Movement. Term sometimes used for the organized resistance to the Germans which developed in German-occupied countries during the Second Great War. See Resistance Movement; V Campaign.

Underground Railroad. Popular designation of the system organized by the abolitionists in the Northern states of America to assist fugitive slaves from the Southern states to reach Canada, where they automatically became free men. The favourite routes were through Ohio and Pennsylvania, sympathisers in these parts helping the fugitives on their way by giving them shelter, food, and money. Occasional heavy penalties inflicted on those who thus broke the fugitive slave laws failed to break up the system.

Underground Railway. In London this term was originally applicable only to the Metropolitan and Metropolitan District rlys., which in the days of steam trains were popularly called the "underground." But it was later extended to include the system of tube rlys. known as the London Electric rly., and with the incorporation of the two systems under one management and the electrification of the older lines the distinction between "underground" and "tube" disappeared. The equivalent U.S. term is subway.

Underpinning. In building, the substitution of new for old foundations. As applied to ordinary buildings the process generally consists of cutting away the old

foundations in sections of a few feet at a time—after shoring up the wall immediately above the part excavated—making a wider and deeper foundation of concrete or masonry, and bonding it in with the original wall. See Building.

Understanding. Philosophical term sometimes considered synonymous with reason (*q.v.*), but usually distinguished from it. Understanding is discursive, proceeding by means of reason and argument, gathering up a number of ideas and bringing them under one common idea. Reason is intuitive, and immediately grasps both premise and conclusion, and at once seizes the truth of facts. Understanding works within the sphere of experience; reason is connected with the supersensuous.

Under the Greenwood Tree. Second novel by Hardy, first published in 1872. The most completely happy of the Wessex novels, it takes a pastoral theme, borrowing its title from Amiens' song praising rustic life in *As You Like It*. Woven into the love story are descriptions of Christmas festivities, and the conversations in dialect are unsurpassed.

Underwood. Growth from a stool or stock of such woods as grow rapidly. It does not form timber; but the wood is useful for faggots. In law underwood is a crop, and the tenant of the land where it grows is entitled to cut it at such times as are customary; but he may not cut it at other times. If he does, he is committing legal waste, and is liable to an action for waste. Underwoods was the name given by Stevenson to a set of short poems, mostly written at Bournemouth.

Underwriter. Originally one who insured ships and their cargoes against loss and damage, but now most underwriters undertake many kinds of risk. The name is due to the fact that underwriters write their names under the wording of the policy. The term is also used for those who underwrite, *i.e.* insure, appeals to the public for capital, whether made by states, municipalities, or business houses. The underwriter, in return for a commission varying with the risk, agrees to take up all that the public does not subscribe for. Risks of almost every other kind can be insured with underwriters. The association of underwriters in London is known as Lloyds (*q.v.*).

Undine (Lat. *unda*, a wave). Name for the class of Water-nymphs in the Cabballistic system of Paracelsus. An undine possessed

no soul, but acquired one, and at the same time took on the ordinary conditions of humanity, by bearing a child to a mortal. Baron de la Motte Fouqué's story of Undine, 1811, Eng. trans. E. Gosse, 1912, is based on this legend.

Undset, SIGRID (1882-1949). Norwegian novelist. She was born of a Norwegian father and Danish mother at Kalundborg, Denmark, May 20, 1882. Until 1909 she was in commerce, but published a successful first novel, *Fru Marta Oulie*, in 1907. Jenny in 1912 established her fame. Later stories, some appearing in English trans., included the striking trilogy of life in the Middle Ages, *Kristin Lavransdatter* (1920-22)—the main reason for her being awarded in 1928 the Nobel prize for literature—and *Olav Audunsson* (1925-27). She wrote a discursive autobiography, *Men, Women, and Places*, 1939, and died June 10, 1949.

Undue Influence. English law term. According to the court of chancery it is influence exerted by way of pressure on a person not capable of resisting it, in order to benefit the person exercising the pressure. The court will set aside any gift or will so obtained. Certain persons are, by reason of their position, more readily suspected than others. Thus, a solicitor who obtains a gift, etc., from a client, or a doctor from a patient, or a priest from a penitent, or a guardian from his ward, especially if the donor is old or in feeble health or not strongminded, is in such a position. But whenever it can be shown that the relations between donor and donee are such that the donor leans upon the donee, or is under his thumb, the court will regard with great suspicion any transaction between them.

By the Corrupt Practices Act, the term is applied to any intimidation, threat, force, or restraint, in order to induce any person to vote or not to vote, or to punish him for having voted a certain way, or for having refrained from voting. Undue influence, in this sense, being obviously an interference with the freedom of the electorate, is a ground on which an election petition may be presented to unseat a M.P. on whose behalf it has been exercised.

Undulant Fever. Vague illness characterised by prolonged fever with a tendency to long relapses and accompanied by malaise, neuralgia, and painful swellings of the joints. It is also sometimes called Malta fever, Mediterranean fever, or abortus fever.

It was common in Malta until the milk of the local goats was boiled by the British garrisons, the organism being conveyed in goats' milk. Other subdivisions of the germ are conveyed by cattle, in which it causes abortion.

Mortality rate in humans is low except when the disease manifests itself in the rare malignant form. But chronic types can leave the patient grey and thin and liable to acute relapse. Treatment consists in general nursing and dieting and in relieving the symptoms as they arise; specific therapy is not established.

Unemployment. Term for that condition in which a person dependent on his earnings for his living has no work to do. The U.K. publishes statistics of unemployment, but these include only those who have registered themselves as unemployed at an employment exchange or appointment office of the ministry of Labour. There are at all times some thousands of others seeking employment. Registered unemployed in the U.K. on Sept. 13, 1948, numbered 321,000, or about 1.5 p.c. of the total registered employed pop. Total registered unemployed in 1939 were 1,305,000; 1938, 1,912,000; 1935, 1,888,000; 1932, 2,776,000. The International Labour Office estimated in 1933 that in the 19 European countries about which it had information there were about 13.6 million persons out of work, or about 1 in 5; in addition, some millions of peasant farmers were without much of their customary income. For most of the years from 1923 to 1938 many industries in the U.K. had more than 10 p.c. of registered unemployment; in 1932 the average figure was 22.5 p.c., and in some industries was more than 40 p.c.

Unemployment was at times a problem long before the industrial revolution. From the 1850s it became a serious social and political evil. Great depressions of trade (such as those of 1858, 1868, 1879, 1893) were followed by revivals, more or less marked; but from 1850 to 1910 some 10 p.c. of workers were on the average unemployed. The First Great War was followed by a world slump in 1921-22 when more than 20 p.c. were unemployed in Great Britain; during the next decade unemployment ranged between 10 and 15 p.c. The world depression of 1931-33 put the figure higher than it had ever been since records were kept.

Unemployment has been attributed, among other things, to (a) restrictionist policies, that is, the attempt of industrialists and traders to obtain the maximum profit through high profits on few goods; (b) mistaken forecasts of demand and of other producers' output, and consequent ill-judged investment; (c) "over-production," that is, so much investment in machinery and raw materials, etc., that capacity to produce grows more rapidly than ability to buy; (d) "under-consumption," that is, a distribution of the national income leaving too little to the mass of the public to enable them to buy the goods that the factories produce; (e) the inability of the political and economic organization of distribution to keep pace with improvements in technology; (f) low prices paid to primary producers—who in the world as a whole outnumber those engaged in manufacture and trade; (g) recurrent poor harvests and bumper harvests, equally ruinous through faulty marketing; (h) sweated labour abroad, particularly in India, the Far East, and Africa; (i) excessive speculation, induced by undue optimism, followed by loss of confidence; (j) lack of mobility and adaptability of workpeople, plant, and machinery; (k) tariffs and other barriers to world trade.

It has come to be widely believed that, given sufficient powers, and with the help of adequate statistics, a govt. can prevent booms and slumps, and organize for full employment, that is, restrict unemployment to short-term dislocations caused by economic change. *See* Depressed Areas; Labour; Trading Estates.

U.N.E.S.C.O. Initials of United Nations Educational, Scientific, and Cultural Organization, a subsidiary body of the United Nations set up at a conference in London, held at the invitation of the British govt. Nov. 1-15, 1945, and attended by 44 of the United Nations including all the major powers except Russia. Its objects are to promote mutual understanding between peoples through interchange of teachers and students and exchange of information about educational methods and facilities. Julian Huxley (*q.v.*), elected first director-general, 1946, was succeeded 1948 by Torres Bodet, foreign minister of Mexico. The organization has a permanent office at 19 rue Kléber, Paris.

Unfederated Malay States. The states of Johore, Kedah,

Kelantan, Perlis, and Trengganu, formerly independent powers, but now included in the federation of Malaya, are dealt with separately in this work.

Unfinished Symphony. Popular name for Schubert's symphony No. 8 in B minor. After two movements, allegro and andante, had been written at Vienna in 1822, the work was abandoned, though it marks the beginning of Schubert's mature period which culminated in the great C major symphony. Nine bars of a scherzo were written in full score, together with sketches for its completion. Schubert never heard this music, which was first played in Vienna, 1865, and in England at the Crystal Palace, 1867, becoming a favourite.

Other unfinished symphonies are a third by Elgar, designed on a large scale; and Borodin's No. 3 in A minor, which, consisting of two movements, was orchestrated by Glazounov.

Unfunded Debt. Alternative name for Floating Debt (*q.v.*).

Ungava. Dist. of Canada, formerly a territory of the dominion and now part of Quebec. It is the northern part of the Labrador peninsula and its area is 351,780 sq. m. The climate is too cold for most agricultural pursuits, but it has rich mineral deposits, including iron, lead, and copper, and quantities of fur-bearing animals, martens, foxes, etc. A good deal of the land in the E. is covered with forests. Ungava was originally part of Rupert's Land, and as such belonged to the Hudson's Bay co. The territory gave the title to an adventure story by R. M. Ballantyne. In 1869 Ungava was purchased by the dominion, and in 1895 the territory of Ungava was created out of it. In 1912 this was added to the province of Quebec under the Quebec Boundaries Extension Act.

Ungava Bay. Bay of Canada, in the N. of the Labrador peninsula. It extends S. from Hudson Strait and receives the waters of the Leaf, Koksoak, Whale, and George rivers. It is about 175 m. wide and extends inland for about the same distance. In the N.W. is the island of Aukpatok.

Ungulata (Lat. *ungula*, a hoof). Subdivision of the mammals which includes all the hoofed forms, such as the cattle, sheep, antelopes, giraffes, deer, camels, llamas, pigs, hippopotami, rhinoceros, horses, hyrax, and elephants. In these the limbs have completely lost the power of grasping, and the feet are

adapted for movement only, the toes being protected by an external casing of horny substance known as a hoof. The number of toes is usually reduced, as in the rhinoceros, which has three, and the horse, which has only one. From this feature, the ungulates are divided into two groups. The Perissodactyla, or odd-toed ungulates, include the horse; while the Artiodactyla, or even-toed ungulates, include the cattle, deer, sheep, etc. It is among the ungulates that the function of ruminating or chewing the cud is developed. See Horse.

Ungvar. Magyar name of town described under its Ruthenian name Uzhgorod.

Uniate (Russ. *uniyat*, from Lat. *unus*, one). Oriental churches which have been brought into communion with the Church of Rome, but retain their ancient rites, liturgies, and customs. Their clergy are allowed to be married; they communicate in both kinds, and they use leavened bread in the Eucharist. They originated in Poland in 1596, when part of the Lithuanian Church submitted to the pope, but in the 18th and 19th centuries, under Russian pressure, many of their congregations rejoined the Greek Church. This Ruthenian Church, as it was called, was by far the largest of the Uniate Churches, numbering between three and four million adherents. The Rumanian Uniate Church, chiefly in Transylvania, numbers about 1,000,000. The Maronites (*q.v.*), Catholic Armenians, and Christians of S. Thomas are next in importance. The other Uniate Churches are very small.

Uniaxial Crystal. A crystal having only one axis of symmetry. Light rays are propagated through crystals in different ways. On this basis crystalline minerals, for example, are classified as isotropic or anisotropic, and the latter into uniaxial and biaxial minerals. Uniaxial minerals consist of those which fall into the tetragonal and hexagonal groups, based on crystallographic symmetry. Uniaxial crystals behave in characteristic ways when viewed under the petrologic microscope by transmitted polarised light. The principle is much used for identifying minerals. See Crystallography.

Unicorn (Lat. *unum*, one; *cornu*, horn). Fabulous quadruped, resembling a horse, with a single long, forward slanting horn on its forehead. Ctesias mentions it as inhabiting India, but at a later

date it was placed in Africa. It is probably derived mainly from the rhinoceros, perhaps also from the



Unicorn in heraldry

oryx, depicted on ancient monuments in profile, but its spirally twisted horn is the tusk of the narwhal (*q.v.*). The unicorn, it was believed, was fierce and swift, but could be immediately tamed by a virgin. Cups of its supposed horn, really rhinoceros horn, were thought to make poison harmless. Represented with cloven hoofs and a tufted tail, it is used as a device and supporter in heraldry. The supporters of the royal arms of Scotland are two unicorns argent, crined and gorged or. See Persia.

Uniform (Lat. *una forma*, one pattern). Dress of one pattern or colour distinguishing those belonging to one service, organization, or business concern. British military uniforms date from the 17th century, when most regts. were raised by colonels, who chose the particular garb the units wore. The few regts. enlisted for the direct service of the sovereign wore the royal livery of scarlet. Red became the uniform of all regts. during the Commonwealth, the facings (revers, cuffs) being in the colours of officers who had originally raised them. After the Restoration, the household troops wore red uniforms with royal blue facings.

Throughout the 18th and 19th centuries British military uniforms became increasingly decorative and unserviceable. Many elaborate features were borrowed from foreign countries: hussars wore Hungarian dress with a useless pelisse, lancers the square Polish cap, dragoons the French cuirass or breastplate. Towards the close of the 19th century, all royal regts. wore blue facings; all non-royal English and Welsh regts., white facings; Scottish regts., yellow; and Irish, green. In 1900, regts. reverted to the facings they had worn on full dress in 1881. Elaborate uniforms continued to be worn on the battlefield until the S. African War, when khaki tunics and trousers were introduced. Thereafter dress uniform was abolished by the army except for ceremonial occasions.

In April, 1939, khaki Battle Dress (*q.v.*) was introduced as the service uniform of all branches of

the army and was adopted in blue or blue grey by the R.N. and R.A.F. It also became the uniform of civil defence, fire service, merchant navy, etc. Variations of battle dress were ultimately adopted by most foreign countries. By 1949, the only regimental distinction in the service uniform of British regts. and corps was the colour of the beret: infantry, blue; R.A.C., black; rifle regts., green; airborne, maroon. In 1946, the kilt was restored to Highland regts. Guards and household cavalry reverted to full dress scarlet and gold for ceremonial duty in 1948. (*Consult Uniforms of the British Army, J. Laver, 1948.*)

Under the Tudors a green livery was worn in the British navy, and in Stuart times red. The present blue uniform was adopted in 1840 and has altered only in minor details. Naval officers' full dress blue uniform with white slashes dates from the reign of George III. The blue-grey R.A.F. uniform was introduced in 1918 and the open-necked tunic for other ranks in 1938; this was the first service in which all ranks wore collars and ties.

With the development of the European dictatorships, political uniforms were introduced, e.g. the Fascist black shirt, the Nazi brown, the Falangist blue, and the Communist red. This last had been the uniform of Garibaldi's followers in the liberation of Italy. Politicians who favoured the establishment of a dictatorship in Great Britain followed Continental models and clothed their supporters distinctively. By the Public Order Act of 1936, however, wearing political uniforms in the U.K. was forbidden.

Distinctive uniforms are worn by the boy scouts, girl guides, Salvation Army, Church Army, and Y.M.C.A. officials attached to service establishments. Most public schools require pupils to wear uniform dress; amongst these are the blue gown of Christ's Hospital, Eton short jacket, and Harrow straw hat. Most large industrial firms require their employees in contact with the public to wear a uniform, as do the post office, railways, and road transport undertakings.

Uniformity. Condition of similarity or agreement. The word is applied in history to a condition in which all persons profess the same religious opinions. In England the Acts of Uniformity, four in number, were statutes passed to secure general uniformity in the doctrines, services, and observances of the

Church of England. The first accompanied the issue of the first book of common prayer in 1549, requiring the clergy to conform to the new prayer book. The second, which accompanied the issue of the second prayer book in 1552, departed from the first by imposing pains and penalties upon the laity as well as upon the clergy who did not conform.

The third came after the accession of Elizabeth, with the issue of the third prayer book in 1559. In the interval, under Mary, the clergy had reverted to the Roman use; the new Act applied only to the clergy, and appears to have caused not more than 200 resignations—probably because it was understood that the authorities would be lax in the permission of evasions. The fourth Act of Uniformity followed the Stuart restoration (1660) and accompanied the revision of the Liturgy in 1662. It ordered the use of the revised liturgy in every church and chapel, the regular ordination according to the Anglican rite of all incumbents before S. Bartholomew's day following, and a formal declaration from all of their entire acceptance of the service book. The result was the resignation of over 1,200 incumbents. See Nonconformity; Prayer Book; Toleration.

Unigenitus (Lat. *unus*, one; *genitus*, begotten). Name given to the papal bull issued to suppress the Jansenist heresy, 1713. After many years of controversy and attempts on the part of the church to convert the Jansenists from their errors, Clement XI issued the bull which condemned 101 propositions of heretical doctrine taken from the works of Pasquier Quesnel (*q.v.*). The French high ecclesiastics and universities declared against the bull and in 1717 formed a party known as the Appellants, from their declared purpose of appealing to a general council. See Jansenism.

Union. In local government, the combination under boards of guardians of two or more contiguous parishes for poor law purposes. Unions were first formed under Gilbert's Act, 1782. The term was popularly applied to a Union workhouse. Boards of guardians were abolished in 1930. See Poor Law.

Union. City of New Jersey, U.S.A., in Hudson co. It stands on the Hudson river, adjoining West Hoboken, and is served by rly. Embroidery and silk goods are the chief manufactures. Here in 1936 was built a cinema where patrons

can see films while seated in their cars. Formerly a part of N. Bergen, from which it was detached in 1861, Union was incorporated as a town in 1864. Pop. 56,173.

Union, Acts of. In British constitutional history, name for the two statutes by which the kingdoms of Scotland and Ireland were united to that of England, in 1707 and 1801 respectively.

The question of the succession having made the matter urgent, in spite of strong opposition on both sides a joint Anglo-Scottish commission drew up a treaty, which was ratified by the English parliament in July, 1706, and by the Scottish parliament in Jan., 1707. It became law on May 1. Scotland obtained guarantees for commercial liberty, the establishment of the Church, and her own law and administration. The United Kingdom of Great Britain was thus formed. (See Scotland.)

The Union with Ireland, due in part to the rebellion of 1798, and the fact that Grattan's parliament represented only a small minority, was effected through the promise of R.C. emancipation, and through compensation to the Irish oligarchy, aided by extensive corruption. The Act was passed by the British parliament, July 2, 1800, and by the Irish parliament, Aug. 1, and came into effect on the first day of the new century. See Ireland.

Union-Castle Line. British steamship company. The line was formed in 1900, being an amalgamation of two existing concerns. The older was the Union Steam Collier Co., founded in 1853 and made



Union-Castle Line flag

into a limited company in 1856. The second was the Castle line, started in 1862 to carry goods between Liverpool and Calcutta. These two lines divided the work of carrying the S. African mails from 1876, and in 1900 they were united as the Union-Castle Mail Steamship Co. H.q. are at 3-4, Fenchurch Street, London, E.C.3. Many of the ships are named after a castle.

Union Cloth. Admixture of materials. Union linens are linen in one direction, generally in the warp, and cotton in the other. Union worsted coatings have a cotton warp and worsted weft. Union flannel is a similar mixture. The name is a notice that the articles are not pure linen, worsted, or flannel.

Union Club. London non-political, social club, founded c. 1800, reconstituted 1821. It had many Irish members. From 1824 to 1924 its premises were in Cockspur St., Trafalgar Sq., then until 1951 at 10, Carlton House Terrace. In 1950 it acquired the premises formerly occupied by the Thatched House Club, 86, St. James's St. Famous members of the Union club were C. J. Fox, Sheridan, Wellington, Peel, Cecil Rhodes, and Lord Kinnaird.

Union Day. A general holiday in South Africa, May 31, the day on which the union of the states was established in 1910.

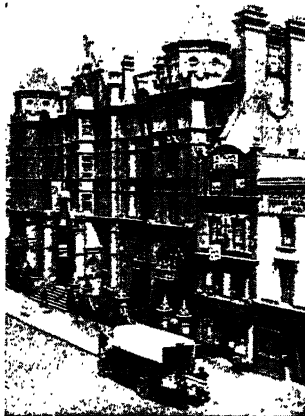
Unionidae OR FRESH-WATER MUSSELS. Family of bivalve molluscs. In Great Britain four species occur: *Unio tumidus* and *U. pictorum*, common in the rivers of S. England; the pearl mussel, *U. margaritifera*, which occurs in the mountain streams of Scotland and Ireland; and *Anodonta cygnea*, the swan mussel.

Union Islands OR TOKELAU. British island group in the Pacific. Lying between 8° and 10° S. lat. and 171° and 173° W. long., the islands belong to New Zealand and are administered from W. Samoa. Until 1926 they were part of the Gilbert and Ellice Islands colony. Copra is the chief product. Area, 4 sq. m. Pop. 1,388.

Unionist. Name of a political party of the U.K., mainly between 1885 and 1922, and latterly virtually synonymous with the Conservative party. Originally the Unionists were Liberals who, under Lord Hartington (later duke of Devonshire) and Joseph Chamberlain, left their party rather than accept Gladstone's proposals for Irish home rule. They set up their own organization and for a time acted as a separate party, the Liberal Unionists, both in and out of parliament. In 1895 some Liberal Unionists were included in Salisbury's govt., and thereafter the coalition of Conservatives and Liberal Unionists became known as the Unionist party. As such they fought the elections of 1906 and 1910. The party organizations, however, remained distinct until 1912. The Unionist leaders joined the coalition govt. of Asquith and Lloyd George, and fought the 1918 election as Coalition Unionists, obtaining the largest representation of any party. After the signing of the Irish treaty, the Unionist party brought about the downfall of Lloyd George, but thereafter the name was dropped, and the older name of Conserva-

tive revived. See *Conservative*; *Home Rule*; *Liberal Unionist*.

Union Jack. British national flag. It is composed of the banner of S. George, white with a red cross, for England; the banner of S. Andrew, blue with a white saltire or diagonal cross, for Scotland; and the banner of S. Patrick, white with a red diagonal cross, for Ireland. The first Union flag showed the blending of the banners of England and Scotland at the union of the crowns in 1603, and was confirmed by the Act of the Union in 1707. This blending was done by placing the cross of S. George fimbriated argent, i.e. with a narrow border of white, over the Scottish saltire. At the Union with Ireland in 1801 the banner of S. Patrick, the red saltire fimbriated like the cross of S. George, was combined with the white saltire of S. Andrew; but not to give undue



Union Jack Club, London. Club buildings in Waterloo Road, opened by Edward VII in 1907

soldiers who fell in that war, and the scheme of a club where service men could meet was taken in hand. A site was selected in Waterloo Road, London, close to Waterloo Station, and here the club premises were opened on July 1, 1907, by Edward VII. Extensions were made in 1910, 1922, 1928, and 1939. Membership is limited to all service men below the rank of officer. Here they can deposit their kit, obtain good meals and a comfortable bedroom there are over (1,000), and avail themselves of a library and writing-room, baths, barber's shop, club store at which everything for ordinary use can be purchased, and all the usual amenities of club life. The benefits of the Union Jack Club to men passing through London in both Great Wars were incalculable.

Union of Soviet Socialist Republics. Official style of the national entity founded by treaty of union, Dec. 30, 1922, between four Soviet republics—those of Russia, Ukraine, White Russia, and Transcaucasia. The country described in this Encyclopedia as Russia consisted in 1948 of 16 republics. That of Transcaucasia was split into Armenia, Azerbaijan, and Georgia in 1936. In 1925 the Turkmen and Uzbek, in 1929 the Tadzhik, and in 1936 the Kazakh and Kirghiz autonomous republics were brought into being, making eleven. In 1940 the Karelo-Finnish, Moldavian, Estonian, Latvian, and Lithuanian republics were incorporated. See separate articles on each country; Lenin; Stalin.

Uniontown. City of Pennsylvania, U.S.A., the co. seat of Fayette co. It is 70 m. by rly. S.S.E. of Pittsburgh, and is served by the Baltimore and Ohio and the

Pennsylvania rlys. Ironfounding and the manufacture of lumber products, iron and steel ware, and glass are carried on. Coal and iron are worked in the neighbourhood. Incorporated in 1796, Uniontown became a city in 1915. Pop. 21,819.

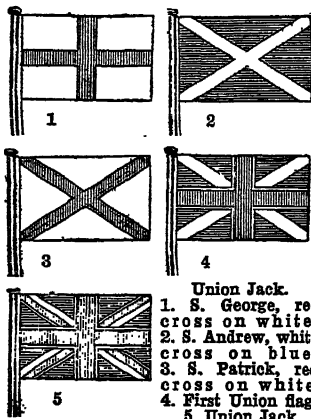
Unipolar. Term used by electrical engineers. Strictly speaking, it is a contradiction in terms, as it implies only one pole, which is an impossibility. It is convenient, however, to apply the word to such devices as a unipolar dynamo.

Unison. In music, the simultaneous sounding by different voices or instruments of two or more notes of exactly the same pitch. Passages are often described as in unison when really they are in octaves as, for example, in the "doubling" of orchestral instruments, or in congregational singing.

Unit. Standard quantity, by the multiplication or division of which any other quantity of the same kind is measured. Absolute units are based on arbitrary units of mass, length, and time. The expression is sometimes applied to the C.G.S. or centimetre, gramme, second system of units in physics. See *Absolute Units*; *Astronomical Unit*; *Units*.

Unitarianism. System of theology. It is a belief that God exists in one Person. Some writers maintain that Unitarianism was coeval with the Apostolic Church. Described as succeeding to Arianism, Arminianism, and Socinianism, it has undergone many changes in modern times. Unitarian congregations first arose in Poland and Hungary, and independently in England. Persecution, the martyrdom of men like Servetus in Switzerland, Biddle and Legate in England, and David in Transylvania, as well as repression in Italy and elsewhere, gave it impetus. After the Reformation many Presbyterians, Independents, and Baptists were drawn to it, and Milton, Locke, and Newton are said to have favoured it. Among later leaders, James Priestley (1733-1804) and James Martineau (1805-1900) in England, and Theodore Parker (1810-60) and W. E. Channing (1780-1842) in America, are conspicuous.

With no creed, and opposed to dogma, Unitarianism in Great Britain has been defined as a belief in the unity of God; in the humanity of Jesus, who is regarded as the supreme religious and moral teacher of the world; in progressive revelation; and in the immortal hope for all man-



Union Jack.
1. S. George, red cross on white.
2. S. Andrew, white cross on blue.
3. S. Patrick, red cross on white.
4. First Union flag.
5. Union Jack

preference, the two saltires were "counter-charged" so that in the first and third quarters the white saltire, and in the second and fourth the red saltire is uppermost.

Properly called the Great Union, the Union Jack is flown on the jack-staff at the bow of a ship. It is illegal to use the Union flag or any ensign for advertising purposes; neither may these be defaced by advertising emblems or lettering. Union Jacks and ensigns flown from ships or buildings should be struck at sunset. No ensign should be flown unless with the Union flag in the jack; the only exception is that a ship in distress at sea may fly the flag upside down to attract attention. See *Flags* colour plate; *Jack*.

Union Jack Club. British institution for sailors, soldiers, and airmen. Soon after the close of the S. African War steps were taken to establish a national memorial to

kind. While believing in the fatherhood of God and the brotherhood of man, Unitarians deny the doctrine of the Trinity, the verbal infallibility of the Bible, and eternal torment. They claim to be open to all the revelations of science and evolution, and to all the laws of change. Their ministers and congregations are free and independent.

Though in the 18th century many congregations of Presbyterian, Independent, and Baptist origin moved towards a Unitarian doctrinal position, the first church bearing the name Unitarian was opened in 1774 by Theophilus Lindsey (1723-1808) in Essex Street, London. The British and Foreign Unitarian Association was founded in 1825, the same year as the American Unitarian Association, and in 1928 came the general assembly of Unitarian and Free Christian Churches. Until 1944 the headquarters of the assembly were on the site of Lindsey's chapel, but that building was completely destroyed by a flying bomb, and temporary headquarters were established at University Hall, 14, Gordon Square, W.C.1. The Unitarian College in Manchester, Manchester College at Oxford, and the Presbyterian College at Carmarthen train students for the ministry. Most of the churches have Sunday schools. In the British Isles are 334 places of worship. The denomination supports a weekly paper, *The Inquirer*; a monthly, *The Unitarian*; and a journal *Faith and Freedom*.

IN THE U.S.A. Just as English Unitarianism originated as a Liberal movement within orthodox Presbyterianism, so American Unitarianism began as a breakaway from the traditional Calvinism of New England Congregationalism. When this schism occurred early in the 19th century Unitarian members were in the majority in many churches, and therefore, according to Congregational polity, retained the property. Thus today one often finds a Unitarian church bearing the name of First Congregational Church (Unitarian) while the orthodox section worships in a later building called Second Congregational Church (Trinitarian). Unitarian churches in the Middle and Far West are mostly of independent and later origin, and many have discarded any theistic belief. Of about 300 Unitarian churches in the U.S.A. nearly half are in Massachusetts, the h.q. of the denomination being

in Boston, where an international Council was started in 1900. Members total fewer than 75,000, but their influence on religious thought in America has been out of proportion to their numbers. Subscribers, besides Parker and Channing, included Emerson and four presidents—J. Adams, J. Q. Adams, Fillmore, and Taft. Unitarian views are also held by the Hicksite Quakers.

Bibliography: Heads of English Unitarian History, A. Gordon, 1895; History of Unitarianism, E. M. Wilbur, 1946; Story and Significance of the Unitarian Movement, W. G. Tarrant, 1948; Beliefs of a Unitarian, A. Hall, 1948; and works by Martineau and Channing.

United Africa Company. Largest individual unit of the Lever Brothers and Unilever group of companies. It is probably the biggest trading company in the world, operating principally in E., W., and N. Africa and the Middle East. It trades chiefly in palm kernels, palm oil, groundnuts, cotton, hides, skins, dates, and rubber. These commodities are normally sold in the open market in competition with other sellers. After amalgamation with the Niger company, the African and Eastern corporation, and others, the co. embarked on manufacturing operations, e.g. making plywood in W. Africa. From the point of view of Unilever, this co. is the principal source of supply of raw materials needed in soap and margarine, and the agency through which Africans are supplied with goods. The co. helped in the inception of the groundnuts scheme financed by the British government in 1948.

United Church of South India. Amalgamation of the Anglican, Methodist, Congregational, and Presbyterian churches in southern India, inaugurated in Madras, Sept. 27, 1947. The church has 14 dioceses, though one of these, comprising Ceylon, remains wholly within the Anglican communion. At its inauguration the church had 8 European and 6 Indian bishops. The Lambeth conference of 1948 warmly welcomed the new church, while expressing some concern at certain features of its constitution, notably the status of bishops appointed after the inauguration of the church.

United Deccan. Name given to a short-lived union of small Indian states. It originated in a meeting in Bombay on Aug. 26, 1947, of the rulers of states in the old group of Kolhapur and Deccan who wished to join the dominion

of India just brought into being. States represented were Aundh, Bhor, Kurundwad, Miraj senior and junior, Phaltan, Ramdurg, and Sangli. On March 8, 1948, the states were merged in Bombay.

United Free Church of Scotland. Presbyterian church which existed from 1900 to 1929. It came into being with the amalgamation of the Free Church of Scotland—result of the Disruption of 1843, when a number of leading ministers and laymen left the Established Church of Scotland—and the United Presbyterian Church formed in 1847. No doctrinal difference existed between the Free Church and the United Presbyterians, and their organization had much in common. But a small section of the Free Church—commonly known as the Wee Frees—held out, and when the union of the two bodies was accomplished in 1900 they held aloof, and claimed that they were now the Free Church of Scotland, and entitled to its property (see Free Church of Scotland). In 1929 the United Free Church rejoined the Church of Scotland (q.v.).

United Irishmen. Society of disaffected Irishmen first formed in Dublin in 1790 by Hamilton Rowan and Wolfe Tone. It was a product of the French Revolution. In Ireland there was much discontent among the Roman Catholics on account of their political disabilities, and among the peasantry generally on account of the impoverished state of agriculture. The necessity for parliamentary reforms provided common ground for a combination of Protestants and R.C.s in the new society—hence the name—but with the victorious progress of the French armies a programme of Irish independence emerged.

In 1796 Tone persuaded the French to send a fleet under Hoche, which failed at Bantry Bay, as did several internal risings. Early in 1798 Lord Edward Fitzgerald made arrangements for a secret rising in Dublin, but the leaders in Dublin were arrested in March, and in May Lord Edward himself was mortally wounded in resisting arrest. Then the counties of Wicklow and Wexford broke into open rebellion. Their headquarters at Vinegar Hill were stormed by Lake on June 26, and with this battle organized resistance collapsed. The last hopes of the rebels were dashed when in Oct. a small French expedition surrendered near Lough Swilly, and Tone was taken prisoner. See Ireland; Vinegar Hill.

THE UNITED KINGDOM: HISTORY FROM 1707

A. P. POLLARD, Litt.D., KENNETH ADAM, and Others

This sketch traces the history of the United Kingdom from 1707, continuing the history of England and Scotland, and from 1800 to 1922 that of Ireland. See biographies of rulers from Anne to George VI; prime ministers and other statesmen from Walpole; also soldiers and sailors. See also British Empire; Europe; First Great War; Second Great War; articles on battles, e.g. Alamein; Somme; Waterloo; movements, e.g. Chartism; Home Rule; and on political parties

The Act of Union between England and Scotland was a stepping-stone towards imperial development, partly because it was in effect an Act for the disruption of England's ancient enemy. Only the Lowlands were united in heart and mind to England in 1707. Scottish national unity, which had been largely maintained by antagonism to England, broke down with the disappearance of the Borders, and Scotland was divided into parties which came to blows in the Jacobite rebellions of 1715 and 1745. France in her future wars with England could look for help only to a diminishing section of the Scottish people instead of to a national Scottish government, and the crowns of the two realms passed in 1714 to the Whig and Hanoverian candidate.

Anne's Successor

There was, indeed, a feeble protest in 1708 in the form of an attempted invasion of Scotland by the Old Pretender, which was frustrated by Byng and his fleet off the Firth of Forth; but this did not disturb the prosecution of the war of the Spanish succession by the Whigs. Marlborough continued to win victories, but little progress was made in the war to wrest Spain from Louis XIV's grandson, Philip V.

The Tories had left the coalition ministry in 1708, and began to accuse the Whigs, especially Marlborough, of continuing the war in their own interests. The prosecution of Sacheverell in 1710 turned Anglican feeling against the government, and Queen Anne was alienated through the influence of Mrs. Masham. Harley (afterwards earl of Oxford) and St. John (afterwards Viscount Bolingbroke) succeeded in ousting Marlborough and Godolphin, and in forming a purely Tory administration, which soon set to work to end the war by negotiations. These were prolonged by the difficulty of securing agreement among the Allies, and England concluded the separate peace of Utrecht in 1713.

From the problem of the Spanish succession the British government turned to that of their own. St. John wanted the Stuarts back in preference to the Hanoverians,

but Harley could not make up his mind, and most of the Tories shied at the staunch Roman Catholicism of the Old Pretender. A few days before Anne died, St. John succeeded in supplanting Harley, but he had no time to reorganize his



United Kingdom. Arms borne by the sovereign

distracted party, or concert measures for the restoration of the Stuarts. The Whigs easily seized the reins of power, and introduced the Hanoverian dynasty.

They did not long remain united. Hitherto they had been the party of war in defence of the Revolution of 1688, and of the Protestant succession against Louis XIV as champion of the Stuarts and Roman Catholicism. The treaty of Utrecht had settled that issue, but the two chief Whig ministers, Stanhope and Sunderland, were still bent in 1714 on playing an active, if not an aggressive, part in European politics. An excuse was provided by the energy of Spain under Alberoni, an ambition defeated by the British naval victory off Cape Passaro in 1718. A peace movement was led by Walpole and Townshend, and gradually the Whigs accepted their later rôle of non-intervention. The South Sea Bubble burst in 1721, and Walpole was called to inaugurate a period of peace, retrenchment, and repose.

In the longest administration of our history, he left a permanent mark by his non-intervention in European wars, development of commercial activity, tolerant administration, and constitutional construction. His tolerance did not

extend to the rivals who disputed his predominance, and one after another his colleagues were driven from office. Gradually these discontented Whigs joined hands with the reviving Tories to form an opposition which brought Walpole down.

War broke out again in 1739 over commercial disputes with Spain, which was determined to keep as closely shut as possible the door into the Spanish dominions in America, while English traders were bent on forcing it open. But this war between England and Spain soon merged in the general European War of the Austrian Succession, which followed on the death in 1740 of the emperor Charles VI without male issue. Walpole, who had resisted the war, tried to limit England's participation; but even his naval measures were unsuccessful, and in 1742 he was defeated, and resigned.

He was succeeded by an unstable coalition until Pelham (1744-54) became prime minister, and the war brought little comfort to the country which had demanded it. For a moment in 1745 it seemed to have opened the door to a Stuart restoration, and Charles Edward advanced as far into England as Derby. He was crushed by the duke of Cumberland at Culloden in 1746; but the French overran the Austrian Netherlands, penetrated farther into Holland than Louis XIV had done, and in India captured Madras. But British sea power was sufficient to rob France of all the fruits of her victories, and restore the *status quo* at the peace of Aix-la-Chapelle, 1748. That, however, was merely a truce; and in 1756 the Seven Years War began.

The Work of Chatham

Pitt, who came into office in 1757, perceived the political values of the struggle, and confined himself in Europe to maintaining naval supremacy, and giving Frederick the Great sufficient help to stave off his enemies. France concentrated her energies on a continental war waged mainly for the benefit of Austria. There were twelve times as many British as French colonists in America; the Spaniards were, indeed, more numerous than either, but Spain did not come into the war until 1761, two years after Quebec had fallen, and had long

ceased to be an efficient ally. Sea power, moreover, was bound to decide a struggle between combatants who relied upon transmarine reinforcements, and a succession of naval victories gave the oceans into British keeping, and turned French dominions overseas into beleaguered garrisons. Louisbourg and Cape Breton fell in 1758, Quebec and Guadeloupe in 1759, Montreal next year, and Grenada, St. Vincent, and Tobago, and the Spanish Havana and Manila in 1762, while French dominion in India was shattered by Clive's victory at Plassey and Coote's at Wandewash. Some of these conquests, notably Cuba and the Philippines, were restored by the peace of Paris, 1763.

George III as King

George III had ascended the throne in 1760, glorying in the name of Briton, and meaning to play the part of patriot king; and the Tories, weaned from their allegiance to the distant and drunken Pretender, were prepared to rally round the throne in its efforts to break the ring of Whig dictators. Pitt himself had smoothed their path by preaching the gospel of efficiency and the virtues of coalition; but the Whigs had done more by dissolving into factions and subordinating principles to interests. There was no longer a Whig party and hardly a Whig principle. Fifty years of power had corrupted its possessors, and reduced them to a circus of seekers and holders of office. George III would have been powerless against a united party or a responsible house of commons; but he made his own party in the house, and his own confidants in the cabinet, until, by undermining one ministry after another, he at length secured in North a prime minister who confessed himself the agent of the king.

To George III more than to any other individual belongs the responsibility for the War of American Independence; but it is idle to ascribe to any one person the deep-rooted causes which provoked that disruption of the British Empire, for there had always been disruptive forces at work.

The Revolution of 1688 had in effect made the executive of Great Britain responsible to a British legislature; but it had not made the executives in the colonies responsible for colonial legislatures; and the Whigs denied to American colonists what they claimed for the British people. Hitherto a breach had been avoided by the laxity of Walpole, the dependence of the

colonies, and the indifference of England. But the Seven Years War had changed all that. The arm of Downing Street was strengthened and prolonged, and it was no longer disposed to leave to colonial arbitrament what had been won by the British navy. There was the vast hinterland of the West, which the British parliament was not inclined to abandon as unearned increment to the colonies; there was also the cost of the war to be met.

On their side the colonists felt that there was now less need for dependence on British protection; and they claimed that, whatever their share in the common expense, it must be granted by their colonial legislatures. They also drew the distinction, as old as parliament itself, between external taxation imposed on foreign trade and internal taxation levied on lands and goods. But the old distinction had been obliterated at home by the control secured by parliament over both forms of taxation, and the British government denied distinction. Furthermore, taxation in Great Britain had ceased to be the grant of divers "states" and become the act of parliament whose sovereignty had been established since the colonies were founded, and had never been recognized by them.

Loss of American Colonies

The issue was joined with hesitation. Pitt (Chatham) and Burke protested, and Rockingham repealed the taxes of Grenville. But reactionary forces were in the ascendant; Grafton succeeded to Chatham, and North to Grafton; extremes on one side provoked extremes on the other. Ten years after the Stamp Act, agitation broke out into open hostilities at the battle of Lexington, and on July 4, 1776, the 13 colonies adopted their Declaration of Independence. In the ensuing struggle the disorganization and mutual distrust of the colonists might have given George III the victory, had not France and other European countries intervened to wipe off the scores of the Seven Years War.

A transient loss of the command of the sea was redeemed by Rodney's victory over De Grasse in 1782; but the moment had been enough to enable the colonists to compel the surrender of Cornwallis at Yorktown; and the war happily ended in England's successful defence against her foes in Europe and India, and in her failure to reduce her American colonies. A corollary of that failure was the end of the king's attempts at per-

sonal government. His agent, North, resigned in 1782, and the Rockingham Whigs were called in to make the peace of Versailles in 1783. But the country was as tired of the Whig oligarchs as it was of George III; and when on Rockingham's death an unprincipled coalition of North and Fox imposed a government on both king and country, George was soon able to dismiss it and put the younger Pitt in office. But he only beat the oligarchs at the price of giving himself a master in a premier dependent upon the constituencies; and the surprising general election of 1784 was a triumph for the minister rather than for the monarch.

The Younger Pitt

Pitt began as an independent Whig with Liberal tendencies. He favoured financial reform, established freer trade with France, sought to establish it with Ireland, reduced tariffs, introduced bills to reform the parliamentary system, and advocated the abolition of the slave trade. The French Revolution made him, if not a Tory, at least a Conservative. At first he welcomed the Revolution, though with less enthusiasm than Fox. Pitt never, indeed, committed the folly of endeavouring to establish a reactionary government in France by the force of foreign bayonets; and he was driven into war, not so much by the crimes of the Jacobins and the consequent agitation in England, as by their insistence on releasing the navigation of the Schelde from the fetters which English and Dutch commercial jealousy had imposed since 1648.

In the struggle that lasted from 1793 to 1815 Great Britain played the leading and lasting part because in that country, despite reaction, there was a more popular foundation for government than on the Continent. But she was enabled to hold out only because she confined her energies for the most part to the war on sea. Her inefficient and insignificant contingents were soon swept out of the Low Countries; her landings in France and Flanders nearly all failed; and she did not intervene in the Peninsula until a popular rising had prepared the way.

Even these efforts would have been impossible without the command of the sea, and French aggression in Europe was partly dictated by the need for fleets to counteract this disability. Howe had destroyed the French Atlantic fleet in 1794; the Spanish fleet, which the French had commandeered, was annihilated at Cape St. Vincent in Feb., and the Dutch off Cam-

perdown in Oct., 1797; Nelson sank the Mediterranean fleet at the battle of the Nile in 1798, and destroyed the Danish at Copenhagen in 1801; at Trafalgar in 1805 he disposed of the French and Spanish vessels which Napoleon had collected, and in 1807 a new Danish fleet was seized at Copenhagen. Masters of the seas, the British were able to seize whatever colonies they chose belonging to France and her allies.

Only command of the sea saved Ireland for the British Empire and prevented the French from rendering to the Irish rebellion of 1798 the service they had rendered to the American insurgents in 1778-81. That success had helped to precipitate England's recognition of Irish legislative independence in 1782. The rebellion which followed 16 years later was the outcome of one of the worst governments in Europe, and Pitt thought that Union, coupled with R.C. emancipation, would at least be an improvement. George III's scruples foiled his hopes of emancipation, and he had to purchase the consent of a corrupt Irish parliament to the Union of 1800.

Coalitions Against Napoleon

Meanwhile the Continental allies wearied sooner than the British of a struggle which brought them relatively little advantage. The first coalition, financed by Pitt, broke up in 1795, his second in 1801; and Pitt resigned either because he could not carry Irish R.C. emancipation, or because he preferred to leave to another the unpalatable task of making the temporary peace of Amiens. The renewal of war in the following year recalled him to a brief term of office, darkened by Napoleon's crowning victory of Austerlitz, glorified by Trafalgar, and ended by Pitt's death on Jan. 23, 1806. He was succeeded by a coalition called the ministry of All the Talents; but Fox died eight months later and subsequent govts. grew more and more Tory.

In 1808 the war took a fresh turn with the Spanish insurrection against Napoleon and Wellington's expedition to the Peninsula. But it was slow progress. Napoleon had little difficulty in crushing Austria in 1809, but in 1812 the disaster of the Moscow expedition made Spain a secondary sphere of operations. First Prussia and then Austria threw in their lot with Russia, and at Leipzig in 1813 Napoleon's armies in Germany were annihilated. Napoleon

abdicated and was exiled to Elba. He returned later to take advantage of the allies, who had almost come to blows among themselves; but they closed their ranks, and Wellington defeated Napoleon at Waterloo on June 18, 1815. The pick of the British troops had been sent to fight the U.S.A. in a fratricidal war which broke out over the British blockade, provoked by Napoleon's Berlin and Milan decrees, and was happily brought to an end by the treaty of Ghent in 1814.

The Congress of Vienna

The congress of Vienna, established peace on the principle of a balance of power, and sought to enforce it by an informal confederation of Europe. The idea of this balance was that there should be five or six great states with power reasonably distributed among them so that no single one should be able to dominate Europe as France had done for 20 years. Great Britain, however, would tolerate no balance of power on the sea nor in any other continent, and clung tenaciously and successfully to her gains in three-quarters of the globe. Nor was there unity of spirit in the confederation of Europe. The three autocracies, Russia, Prussia, and Austria, subscribed in 1815 a document known as the pact of the Holy Alliance, which was to guarantee legitimate monarchs as a band of brothers against revolutionists and usurpers. Great Britain refused, on Castlereagh's advice, to sign; dissociated itself from the efforts of its allies to repress popular insurrection in Italy and Spain; and, led by Canning, in 1823 joined with President Monroe in threatening armed resistance if the Holy Alliance attempted to recover for Spain her revolted South American colonies. Finally, at Navarino, in 1827, Russia, France, and England helped insurgent Greece to break the Turkish yoke.

The repressive system of the restoration had failed to crush the germs of liberal nationalism sown broadcast over Europe by the French Revolution and Napoleon's armies; and the growing spirit of foreign peoples encouraged the revival of Liberalism in Great Britain. The years succeeding the war were unhappy, and the nation descended from the glory of Waterloo to the squalid massacre of Peterloo. No democratic franchise helped to mitigate the burdens bequeathed by the war or apportion the profits produced

by the industrial revolution; and high prices were perpetuated by deliberate legislation like the Corn Laws. Political despotism, secured to the landed classes by the unreformed parliamentary system, was used to deny to others the means of social redress; and the combination of artisans or agricultural labourers was made a crime punished by transportation. They were even denied the education which might have enabled them to appreciate the value of the machinery they broke. Instead the Habeas Corpus Act was suspended, the Six Acts were passed to protect the *status quo*, and discontent, denied legitimate expression through the franchise, was driven to find vent in riots and conspiracies.

In 1822 the more liberal Peel succeeded Sidmouth as Home secretary, and Canning took Castlereagh's place at the foreign office; while in 1823 Huskisson became president of the board of trade, modified the Navigation Acts, and removed some of the restrictions on the working classes. In 1825 a Catholic Relief Bill, though rejected in the lords, was passed by the commons, and in 1827 Canning succeeded Liverpool as prime minister. He died a few months later, and in 1828 Wellington became premier with Peel, Huskisson, and Palmerston as secretaries of state. The Tory government was assuming an almost progressive hue, and in 1828-29 the Test and Corporation Acts were repealed and R.C. emancipation carried, partly as a result of O'Connell's agitation in Ireland. In 1830 William IV, who posed as a Whig, came to the throne, and Wellington, who had declared against parliamentary reform, was replaced by Grey.

The Reform Act, 1832

The government bill having been emasculated in committee, parliament was dissolved and the Reformers returned with a great majority; the bill was passed by the commons with a majority of 109, but thrown out by the lords. A third Reform Bill was destroyed in committee by the lords, and ministers resigned. Wellington failed to form an administration, and the country was saved from revolution by the return of Grey to office with the king's authority to create the peers necessary to pass the bill.

The first reformed parliament, which met in 1833, disappointed expectations. Slavery was, indeed, abolished in British dominions by

an Act of that year, the Poor Law was reformed in 1834, and municipal corporations in 1835. These measures did not satisfy the Radicals, who began to lose faith in the Whigs, and in 1838 the Chartist movement was founded. At the same time the lukewarm reformers turned Conservative, and Peel, who had made two ineffective attempts to form a government, succeeded in driving Melbourne from office in 1841 and obtaining a majority at the ensuing general election. Simultaneously Cobden started the Anti-Corn Law agitation, and free trade became the dominant issue in politics.

Peel was reluctantly convinced, partly by famine in Ireland, of the need of repeal, which he carried in 1846, thereby breaking up his party and putting an end to his own political career. Russell became prime minister and passed a succession of measures, culminating in the repeal of the Navigation Acts in 1849, and Gladstone's abolition of protective duties in 1853, which completed the freeing of trade. The motives of the Cobdenites were somewhat mixed; they wanted cheap food partly at least because they wanted cheap labour, and even Bright was singularly indifferent to the conditions under which the workers laboured. As a protest against these conditions the Chartist movement came to a head in 1848. It died away, but five out of the six points of the Charter have since been carried.

Imperial Expansion

The best work of Russell's administration was done in the development of colonial self-government. The first half of the 19th century had been a period of great imperial expansion. Most acquisitions were treated as crown colonies and governed from Downing Street; but representative institutions had been established wherever there was an adequate white population. The growth of the overseas dominions involved an increasing obligation to maintain their communications; and while naval supremacy was enough to protect sea-routes, it could not relieve Great Britain of anxiety with regard to the land approaches to India, where British expansion was accompanied by a Russian advance across Siberia and in Central Asia. The frontiers of the two empires were continually approximating, and the farther the British boundary was pushed the greater grew the alarm for its security. To bolster up the decadent Turkish empire became a cardinal

point in British foreign policy. This in its turn involved a nearer risk of war with Russia than the danger to the Indian frontier.

The same language was used in England about Russia in the 'fifties as about Germany 60 years later, and in 1854 the Crimean War broke out. Napoleon III's restoration of the French empire in 1852 was condoned in consideration of his services as an ally against Russia, but both countries had cause to regret in later days their Crimean crusade. The conduct of the war reflected little credit upon the Allies, and a peace was made in 1856, not a clause of which stood the test of time.

India and the Crown

The war was concluded before the Indian Mutiny broke out in 1857, and after harrowing sieges of Delhi, Lucknow, and Cawnpore, it was suppressed in 1858. It was clear that a change in the government of India was essential. The East India company had grown from a trading concern into the owner of an empire. Pitt's India bill of 1784 had given the crown a joint control with the company, and an Act of 1833 had vested the supreme direction of the government in a governor-general and council. Now in 1858 a new India Act transferred all the territories and powers of the company to the crown; and a secretaryship of state for India was established, corresponding to the secretaryship for the colonies which had been separated from the War office in 1854. The imperialisation of India was completed by Disraeli's Act of 1876 conferring on Queen Victoria the title of empress of India. A less glittering but more substantial step towards imperial organization was taken when the Dominion of Canada Act was passed in 1867.

Meanwhile domestic politics stagnated under the soporific influence of Palmerston, who limited his turbulence to foreign affairs. Derby, with Disraeli as his chancellor of the exchequer, had ousted Russell in 1852, but speedily fell before a coalition of Whigs and Peelites under Aberdeen. The latter succumbed to the mismanagement of the Crimean War in 1855 and Palmerston succeeded. He, too, fell in 1858; Derby's second attempt was hardly more permanent than his first; Palmerston came back and his ministry survived until his death in 1865.

His disappearance removed one of the two rival leaders, and Russell re-entered to resume the work of domestic reform. Gladstone was

his moving spirit, as Disraeli was Derby's; but the ministry's Reform bill was defeated by a secession called by Bright the Cave of Adullam, and Russell resigned. Derby essayed a third administration, but resigned after 20 months. He had described as a leap in the dark the Reform bill of 1867, which Disraeli carried through parliament, but had taken it, as he expressed it, to "dish the Whigs." Disraeli became prime minister in Feb., 1868, but was defeated in the elections of the autumn, and Gladstone formed his first cabinet.

Its reforming activity far surpassed that of its predecessors. The Irish Church was disestablished and partly disendowed in 1869. In 1870 the first of the great Irish Land Acts was passed, and Forster's Act set up public compulsory education by means of popularly elected school boards. In 1872 the Ballot Act established secret voting at parliamentary (other than university) elections; the judicial system was remodelled by the Judicature Act of 1873; and the purchase of commissions in the army was abolished by order in council. Public opinion approved of the neutrality maintained by the government during the Franco-Prussian War, but was more critical of the submission to arbitration of the dispute with the U.S.A. over the Alabama. Other Acts abolished religious tests at Oxford and Cambridge, and enabled Anglican clergy to divest themselves of their orders. Finally, Cardwell cured the army for the time of the paralysis which beset it.

Disraeli's Imperialism

The government, defeated over its Irish University Bill in 1873, remained in office until in Jan., 1874, a dissolution was followed by a Conservative victory at the polls. Disraeli came for the second time into office as prime minister and for the first time into power; and his advent diverted public attention from domestic problems to foreign and imperial policy. He represented one stream of public opinion as Gladstone stood for the other; and Disraeli's administration saw the first outburst of modern British imperialism. His first achievement was the purchase in 1875 of shares in the Suez Canal.

The construction of this canal by de Lesseps in 1869 had profoundly altered the strategic situation of the British Empire by providing a sea-route to India three weeks shorter than that round the Cape. The purchase of these shares led by reluctant steps to an increasing

amount of British intervention in Egypt, until the whole of its territories and a good deal more passed under British control. Similar interests involved the government in Afghan wars to counter the advance of Russia, and encouraged a pro-Turkish policy which hampered the liberation of S.E. Europe, brought the nation to the verge of war with Russia in 1877-78, and facilitated the establishment of German influence in the Balkans as a counterpoise to Russia's.

The Transvaal and Egypt

Disraeli's indifference to Turkish atrocities had, however, alienated large sections of British opinion, and the "peace with honour" which he brought back from the congress of Berlin in 1878 was a feeble set-off against the indignation which Gladstone evoked by his pamphlets and his Midlothian campaigns. The general election of 1880 returned the Liberals to power with a large majority, and Gladstone, who had retired from leadership in 1874, was found to be the only possible premier. His second administration, 1880-85, had a chequered career, partly due to troubles it inherited and partly to its own divisions and mistakes. The Transvaal Boers revolted and were regranted their independence after winning the battle of Majuba, but British prestige was restored in Afghanistan by Roberts's march to Kandahar.

In Egypt the dual control of England and France, established in 1876, created friction and discontent; and France withdrew, leaving her partner to deal with the formidable native revolt raised by Arabi Pasha in 1882. Alexandria was bombarded and Arabi's revolt crushed, but a more serious religious movement broke out in the Sudan under the Mahdi. Gordon went to Khartum to see what could be done by moral suasion; he was there besieged by the Mahdi's forces and killed in the capture of the place in 1885, while an expedition under Wolsley was coming to his relief. Ireland was even more troublesome. The mild Home Rule movement which Butt had led in the 'seventies was supplanted by the more aggressive policy of Parnell, which sought by obstruction to render the transaction of business in parliament impossible, and well-nigh paralysed the arm of the law in Ireland. The chief domestic measure of the government was the Franchise and Redistribution Act of 1884-85, which gave the vote to some two million agricultural labourers, and

extinguished a number of small boroughs.

In 1885 Gladstone's government was defeated on the budget, and Salisbury took office without a parliamentary majority, pending the result of the general election to be held under the new Franchise Act in the autumn. The new voters gave the Liberals a majority of more than 80 over the Conservatives; but there were 86 Home Rulers, and Salisbury continued in office to see what they would do when parliament met in 1886. His government was defeated on Jan. 27, and Gladstone formed a ministry pledged to some form of Home Rule. Hartington and Goschen refused to join it; Chamberlain resigned before the bill was produced; and Bright announced his opposition.

Nearly 100 Liberal members followed their example and became known as Liberal Unionists. With their help the Home Rule bill was defeated by 30 votes; Gladstone dissolved in July, and Salisbury returned to power with a majority of 116 Conservatives and Liberal Unionists. His six years' administration was marked by the revived coercion of Ireland combined with Liberal Unionist measures for England. Free education was established and county councils were set up, while abroad large parts of Africa were partitioned in 1890 between England and Germany, which also received Heligoland.

End of the 19th Century

Gladstone remained bent on his Irish policy, but at the general election of 1892 he obtained the exiguous majority of 40. He took office for the fourth time and carried a second Home Rule bill through the commons in 1893; but it was rejected by the lords, and his colleagues in the cabinet refused to assent to a dissolution, and differed from Gladstone over the naval estimates. Consequently he resigned in 1894, when Lord Rosebery was chosen premier in preference to his older colleague Harcourt. The government hung on with a majority of a dozen until July, 1895. Then it was defeated on a division, and resigned. Salisbury resumed office, dissolved, and secured a majority of 152 at the general election.

Henow included the chief Liberal Unionists, Hartington, Chamberlain, and Goschen in his government, and his path was further smoothed by dissensions between the Rosebery and Harcourt factions of the opposition. The Jameson Raid was a premature and ill-

advised indication of the direction in which the new government was likely to move; but the reconquest of the Sudan was brilliantly carried out by Kitchener in 1896-98, and an awkward dispute with the U.S.A. over the boundary between Venezuela and British Guiana was satisfactorily settled. An excellent Irish Local Government Act was passed in 1898, imperial penny postage was established, Weihaiwei was impulsively annexed, and parliamentary sanction was given by the Commonwealth of Australia Act of 1900 to the federation of the six Australian states.

But the disputes with the Transvaal were not well handled, and a war broke out in 1899, which lasted three years and added nothing to Britain's reputation.

A. F. Pollard

Men and materials for the S. African War were drained out of the country for nearly three years before the inevitable victory over the Boers added the Transvaal and Orange Free State to the British empire. In the midst of it a general election returned the Unionist party to power with a smaller majority. The death of Queen Victoria in 1901 wrote finis to an epoch. To the mental and material triumphs of the Victorian age succeeded the Edwardian decade whose freedom and gaiety served to disguise the drift to European catastrophe.

An "entente" permitting a free hand for France in Morocco and for the U.K. in Egypt promised better relations between the two countries, but public interest focused rather on Chamberlain's dream of an imperial customs union and the campaign for tariff reform which led him to leave the govt.; also on Balfour's Education Act of 1902, which caused a Nonconformist passive resistance movement in protest against the obligation to contribute as ratepayers to church schools. Balfour succeeded Salisbury as premier in 1902 and remained until the end of 1905, his govt. becoming increasingly unpopular and ineffectual. Its policy of supplying cheap Chinese labour for the Transvaal gold mines played a considerable part in the election of 1906, which brought the largest turnover of votes for 80 years and put the Liberals in power with the huge majority of 350, under Sir H. Campbell-Bannerman. The Liberals were supported by 51 Labour members, now represented in any strength for the first time.

The house of lords soon showed itself determined to prevent Lib-

eral reforms from reaching the statute book. But solid achievements were recorded. The Boers were entrusted with responsible self-government, which paved the way for the Union of S. Africa in 1910. The army was reorganized, old age pensions were introduced, and trade boards set up to regulate sweated industries. On the other hand, three attempts to deal with education petered out, an instalment of Irish home rule was abandoned, and a licensing bill which would have closed 30,000 public houses in 14 years suffered a similar fate. The hostility of the upper house reached new heights when Lloyd George, chancellor of the exchequer in Asquith's ministry (Asquith had succeeded Campbell-Bannerman in 1908), brought in the so-called "people's budget" of 1909, which included land taxes. Inflamed by Lloyd George's speeches at Limehouse and elsewhere, the lords decided to reject the budget and "damn the consequences."

Stormy Years

Constitutional battle was now joined. An election early in 1910 reduced the Liberal majority, but Asquith proceeded with a bill denying the right of the lords to veto any money bill and reducing the veto to a suspensive one. Edward VII died with the issue still clouded. After an abortive conference between representatives of the two parties, a second election was held before the year's end, but this produced little change. Asquith announced that the new king, George V, would exercise his prerogative to create enough new peers to secure the passing of the bill. The Act ultimately went through the house of lords in 1911, by a majority of 17. The first use to be made of it was to pass measures for Irish home rule and Welsh church disestablishment.

Meanwhile militancy at home continued with the threat of armed resistance in Ulster if home rule was implemented; with the growth of "direct action" in industrial disputes, many strikes and lock-outs culminating in the national railway strike of 1911 and with the great coal strike of 1912; and with the disturbances by "suffragettes" which reached alarming proportions. Abroad the same spirit waxed strong. The Agadir incident (1911) brought the U.K. and Germany to the brink of conflict. Popular clamour for dreadnoughts to counter German naval building intensified the armaments race still further.

War, when it came in 1914, began in the east, but with Germany's invasion of Belgium the "scrap of paper" which bound Great Britain to the Continent was invoked, and domestic differences were sunk at once in a national effort which brought a million men voluntarily to the colours in five months. However, trench warfare in Europe put a heavy strain first on enthusiasm, then on endurance. An attempt to sidetrack the western front at Gallipoli failed, and this, together with a revealed shortage of shells, hastened the formation of a coalition govt., under Asquith. During 1915 the country learned to accept high prices, and the trade unions to accept dilution of labour and the employment of women in industry.

With total conscription early in 1916, the U.K. was organized on a war footing.

The year 1916 brought the horror of the first air raids and the boon of "summer time." Intrigues in and out of parliament coincided during the winter with a general feeling of stalemate to oust Asquith and install Lloyd George as premier. This rift between old colleagues marked the beginning of the Liberal party's decline, but the running of the war was smoothed and accelerated. New ministries were given to business men. The U-boat attempt to starve the British Isles was met in 1917 and 1918 by Q-ships, armed merchantmen, the convoy system, and rationing. The entry of the U.S.A. into the war in 1917 and the Russian revolution tended to obscure such important domestic events as the giving of the vote to women (over 30) and the setting up of Whitley councils to resolve industrial disputes. In 1918 the war objective was narrowed to the western front. Internal dissensions marred the last months before victory, and the extension of conscription to Ireland gave Sinn Féin its chance. When Armistice was called in November, an exhausted community was gripped by an influenza epidemic which took toll of thousands of lives.

Lloyd George's 2nd Coalition

The "coupon" election of 1918 returned Lloyd George's coalition to power, but the tactics employed embittered political life and fomented industrial discord. The only substantial achievement of 1919 was the Addison housing scheme which provided badly needed working-class suburbs. Otherwise a succession of strikes, of which the most serious was on

the railways, involved the equivalent of 100,000 men every day of the year. As the flush of victory, during which demobilised servicemen had been absorbed into industry, faded, unemployment rose to one-and-a-half million and stayed there. A miners' strike failed, and wages fell generally. At the Peace Conferences, nationalism, insistent on territorial adjustments and unreal reparations, ran rife; the wisdom of the British representatives was not conspicuously greater than that of their allies. Ireland, India, and Egypt took steps towards freedom, though not before blood had been spilled. Bloodshed in Ireland was rife, where what was in effect a guerrilla civil war raged until the treaty of 1922 brought into being the Irish Free State. Thenceforward the United Kingdom was not the U.K. of Great Britain and Ireland, but only of Great Britain and Northern Ireland; and Northern Ireland had her own parliament in Belfast.

Return to Conservatism

In 1922 the coalition government fell after a revolt by Unionist "back benchers," and the Conservative leader, Bonar Law, for long the lieutenant of Lloyd George, entered upon a few months of power before his death in 1923. His one-word policy, "tranquillity," was adopted by his successor, Baldwin. But in 1923 Baldwin went to the country on tariffs, which proved still unpopular. Liberals and the Labour party combined against him, and were in the majority, with Labour the second strongest party in the house. Baldwin resigned, and the first Labour govt. was formed by Ramsay MacDonald. The latter also placed himself at the foreign office, and the acceptance at a London conference of the Dawes Plan for the settlement of German reparations by the principal belligerents of the war was a personal triumph. But Russian relations proved more intractable, and the "Zinoviev letter" helped to put the minority government out after only a few months.

Baldwin's second government, swept into power, faced a serious threat to parliamentary authority when the T.U.C. called a general strike in 1926 in support of the miners. The national stoppage lasted nine days, but the mines were idle for six months. The cost to the nation was incalculable. Two quiet years were followed in 1929 by the first election in which all adults were entitled to vote, and

Labour became the largest party in the house. Dependent on Liberal neutrality, however, the new government found legislation difficult, and a solution to unemployment, swollen by 1931 to 2½ million, impossible. The economic weakness of the U.K., exposed by the May report of 1931, led to "a flight from the pound," and in the emergency a national government was formed. Though this failed to keep the country on the gold standard, it received overwhelming support at the polls. In the next few years progress towards recovery was marked by the final abandonment of free trade and the introduction of government marketing schemes for agriculture, termed "socialism of the right." MacDonald retired in favour of Baldwin in 1935, and the "Samuelite" Liberals left the ministry, which though predominantly Conservative, clung to the "national" label, even after the election of 1935 confirmed the Conservative majority.

The Darkening Prospect

Before the year was out the Italian invasion of Abyssinia and the attempt to impose sanctions on the aggressor had recalled the country to anxious contemplation of a steadily darkening international horizon. In 1936 Mussolini triumphed in Africa, in the face of a League of Nations equally powerless to arrest Hitler in the Rhineland or the intervention of both dictators in the Spanish Civil War. The government's policy of "non-intervention" was strongly criticised, as was its slowness in re-arming.

The death of George V in 1936 was quickly followed by the abdication of Edward VIII in order to marry the woman of his choice, an incident which might well have shaken the prestige of the British crown had it not been handled with consummate tact by Baldwin, in conjunction with the governments of the various dominions in the Commonwealth. Baldwin was succeeded by Neville Chamberlain, son of Joseph, who developed a foreign policy of appeasement, which led to the prolonged crisis over German demands on Czechoslovakia in 1938, and his three meetings with Hitler, culminating in the Munich agreement. His optimism, following that agreement, in seeing it as a sign of "peace for our time" was short-lived. Preparations for war were advanced, and Hitler's betrayal of the agreement in March, 1939, was the end of appeasement. The

1939 budget allocated £580 millions to service requirements, including civil defence. Hitler's entry into Prague and Mussolini's invasion of Albania caused British pledges to be given to Poland, Greece, and Rumania. The keynote of the new foreign policy was resistance to aggression; its logical result was conscription, introduced for the first time in history while the U.K. was nominally at peace. The British pledge to Poland was implemented two days after the German invasion of Sept. 1, 1939. For the second time in 25 years the U.K. declared war on Germany and a war cabinet was set up immediately.

Kenneth Adam

During the first quiescent months of the war the govt. remained virtually a Conservative govt. The Labour opposition, though wholeheartedly supporting the war effort, made it clear that they would not serve under Chamberlain. The apparently complacent inactivity of the govt. and the shock of the Allied defeat in the Norway campaign of April, 1940, caused much dissatisfaction, and it became obvious that Chamberlain's ministry had suffered a serious diminution of confidence in parliament and in the country, and that a government on a broader base was essential to counter the full impact of war and lay the foundation of victory. Labour indicated its willingness to join a coalition administration under Winston Churchill, and on Chamberlain's resignation in May, 1940, Churchill became premier.

Churchill as Premier

The change was appropriately timed, for it was made on the very day that Hitler's "blitzkrieg" was turned upon Belgium, the Netherlands, and France. Under Churchill the national will to victory was at once rekindled. His coalition of Conservatives, Labour, and Liberals remained in power and almost unassailable until victory over Germany was achieved five years later. In Churchill was revealed a man as powerful in leading the national spirit as in expressing it, and the country set itself determinedly to wage total war, accepting its inevitable suppression of innumerable cherished personal rights and hard-won freedoms. That spirit was about to be tested to the limit. For before the end of the month the armies of the Netherlands and Belgium had surrendered and the defeated B.E.F. was saved only by the "miracle" of Dunkirk. Eighteen

days later the armistice was signed between Germany and France. The United Kingdom, with the British Commonwealth and Empire, stood alone at the most perilous moment of her history, facing an enemy who occupied as a conqueror the W. coast of Europe from Norway to the Pyrenees, an enemy swollen with success and ready to strike again. It is understandable that not only the enemies of the U.K. but many of her friends thought that a long chapter of glorious history was about to end in unmitigated defeat.

The "Finest Hour"

But the people of the U.K., led by Churchill, refused to see it that way. They entered what Churchill, in one of many inspired phrases, hoped would be "their finest hour" with nothing but firm faith in ultimate victory, and awaited the onslaught calmly. The country became an armed camp—the emphasis in the earliest weeks being on the camp rather than the arms, which were all too few. Among the most remarkable manifestations of the time was the enthusiastic rush of a million volunteers to join the Local Defence Volunteers, later the Home Guard. Large areas of the country were militarised and forbidden to civilians. Plans were made to meet the probability of armed invasion.

But in Aug. and Sept., 1940, the course of history was deflected from the strict line of probability by the defeat of the German Luftwaffe by squadrons of the R.A.F. ("the few") in the air battle of Britain, one of the decisive battles of all time. The German plan of invasion was frustrated, and that particular peril passed. Nevertheless large-scale death and destruction in warfare came again to Great Britain, after a lapse of centuries, with the German air raids on the civil population. These were first made on an intensive scale from Sept., 1940, until June, 1941, and continued intermittently throughout the war, until they reached a climax in assaults by flying bomb and rocket bomb in 1944-45. Most large centres of population suffered, notably London, but also Merseyside, Clydeside, Belfast, Manchester, Sheffield, Bristol, Coventry, Birmingham, ports such as Plymouth, Hull, and Southampton, many seaside towns, and such cathedral cities as Exeter, Norwich, Canterbury, and York. Moreover, innumerable smaller towns, villages, and hamlets had

to bear with equal fortitude the ravages of war, e.g. Petworth, Sussex, where a bomb falling on a school wiped out almost a whole generation of the town's children. In addition the Dover area was within range of constant hostile shell-fire. Nowhere was there any flinching of morale. Civilians became painfully accustomed to the noise of battle as planes and A.A. guns fought the menace. A highly organized system of civil defence was of incalculable value in sustaining high standards of courage and efficiency in the face of the prolonged danger.

Meanwhile the U.K. acquired a new importance as the rallying ground for the fighting forces and governments of those countries which had been occupied by Germany. Poles, Czechs, Dutch, Belgians, Norwegians, the Free French, and forces of the British dominions and colonies were presently, when the action of Japan had made that country as well as Germany the enemy of both the U.K. and the U.S.A., joined by the U.S. troops in such numbers as to form in many areas an army of friendly occupation. The intensive air bombing of German industry and communications was carried out from the U.K. bases. From the shores of the U.K. that great army of liberation known as the Allied Expeditionary Force was gradually assembled, and from the shores of the U.K. it set forth in June, 1944, to liberate Europe and achieve complete victory.

Socialists in Power

With the end of the war in Europe in May, 1945, the coalition broke up. Churchill continued as prime minister of a so-called "caretaker" govt., mainly Conservative, pending a general election, which followed in July. Labour was returned with a majority over all other parties, and so for the first time attained government with power. The Labour party had won on a programme in which high place was given to proposals for nationalising the country's chief assets and industries, and they soon set about the fulfilment of the programme. The bank of England, the coal industry, the supply of electricity and gas, and the railways were all nationalised within the next three years, and in 1949 a further Act was passed for the nationalisation of the iron and steel industry at a later date. To ensure its passage a special session of parliament was called to pass a new Parliament Act, reducing the period for which the house of lords

could delay the passing of any bill. In addition a comprehensive scheme of social insurance was introduced, including a national free health service for all. The government also maintained a tight hold upon most of the industrial and trade controls of wartime.

Economic Exhaustion

These measures were met by sustained high taxation, and were thus sound enough by internal book-keeping. But the war had left the U.K. in very real danger of bankruptcy. Overseas assets had been so drawn upon as to leave relatively negligible reserves. While the war lasted, the effects of the U.S.A. Lease-Lend system had served to disguise the truth, but when the U.S. declared Lease-Lend at an end immediately after the victory over Japan in Aug., 1945, it was obvious that the U.K. could not for long continue to pay for imports not only of food but of the raw materials necessary for any real revival of her industry and her export trade. A loan to the U.K. of \$3,750,000,000 was therefore granted by the U.S.A. for the purchase (mainly in the U.S.) of necessary food and materials to tide the country over a difficult period. This was originally calculated to last until 1951, but with the rise in U.S. prices and a period of "convertibility" it was almost spent by mid-1947, by which time the exports of the U.K., though satisfactorily higher in total value than before the war, were still a long way from being sufficient to balance imports.

Further time in which to foster the drive for increased exports was given through the launching by the U.S.A. in 1948 of the European Recovery Programme (q.v. in N.V.). Nevertheless, the economic situation of the U.K. remained precarious, the export of British goods being hampered by the high price of such goods in the dollar area, and late in 1949 the govt. therefore introduced a measure of devaluation of the £ sterling in relation to the dollar.

Hostility to the European Recovery Programme by the U.S.S.R. and those countries under her immediate influence served to heighten in the eyes of western Europe and the U.S.A. the menace of Communism and the possibility of a further extension of Russian dominance. Steps towards military union were therefore taken by the U.K. in concert with certain other countries of W. Europe, as an important part of a general programme of Western Union

(q.v.), and these were in 1949 merged in the North Atlantic Treaty (q.v. in N.V.).

In June, 1950, confronted with military aggression by the Communists of N. Korea against S. Korea, the U.N. authorised military assistance to the latter. With naval and air forces the U.K. gave immediate practical support to the U.N. decision, and later sent an army detachment. But the fact of Communist aggression, and its initial success, revealed the urgent and paramount necessity of increased expenditure on rearmament and defence.

Meanwhile, a halt had been called to nationalisation plans as a result of a general election in 1950. Labour remained in office but with a majority over all other parties so small (between 10 and 15) as to preclude further experiment.

Thus the middle of the century found the U.K. under heavy material and economic handicaps with the added anxiety of the possibility of a third war; yet in every respect other than the material retaining her former position as a leader in the comity of nations, and sustained by the hope that in company with the other nations of the Commonwealth she might yet help to constitute the most powerful balancing force in the shaping of the world's future.

Gordon Stowell

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United Methodist Church.

Former religious denomination constituted 1907 from the amalgamation of three Methodist churches: the Methodist New Connexion, founded 1797 by seceders from the Wesleyan Methodists following a dispute over

greater powers for the laity; the United Methodist Free Church, formed 1857 by the union of the Wesleyan Methodist Association and the Wesleyan Methodist Reformers (sects formed 1835 and

1849 respectively); and the Bible Christian Church (q.v.), founded 1815. In 1928 the United Methodist Church became part of the reunited Methodist Church. See Methodism.

THE UNITED NATIONS FROM 1945

Leslie R. Aldous, Head of Information Dept., U.N. Association

This article describes the origins, development, and principal organs, together with their functions, of the body set up by 50 nations in 1945. See also Atlantic Charter; Covenant; Dumbarton Oaks; Food and Agriculture Organization; International Court of Justice; International Labour Organization; International Law; League of Nations; Moscow Declaration; San Francisco Conference; U.N.E.S.C.O.; U.N.R.R.A.; Veto

The United Nations is the organization of states created in April, 1945, which replaced the League of Nations. The first step towards the creation of the United Nations was taken on Aug. 14, 1941, when President Roosevelt and Winston Churchill, after a conference aboard a British warship in mid-Atlantic, issued a joint statement of principles and policies which came to be called the Atlantic charter and foreshadowed a peace affording to all peoples a guarantee against aggression and the establishment of a permanent system of general security. On Jan. 1, 1942, 26 Allied nations signed a declaration subscribing to the programme set out in the Atlantic charter.

Four of the great powers—China, the U.K., the U.S.A., and the U.S.S.R.—assumed prime responsibility for planning the new international authority. By the Moscow declaration of Oct. 30, 1943, they recognized "the necessity of establishing at the earliest practicable date a general international organization, based on the principle of the sovereign equality of all peace-loving states, and open to membership by all such states for the maintenance of international peace and security."

Meeting of Fifty Nations

Exploratory discussions, begun immediately after the conference at which this declaration was drawn up, resulted in agreement on certain basic points. Representatives of the four powers conferred at Dumbarton Oaks, Aug.-Oct., 1944, to work out detailed proposals, and in due course invitations were issued to a conference on international organization at San Francisco, held April-June, 1945, which drew up the charter of the United Nations, signed on June 26 by the representatives of 50 nations taking part in the conference. Admissions to the organization during 1946-48 raised the membership to 58 nations; and

the inviting powers on May 4 invited France (who had declined to be an inviting power) on a basis of equality.

The charter, the obligations of which are accepted by all states members of the United Nations, is a much longer and more detailed document than the covenant of the League of Nations. It consists of a preamble and 111 articles, as compared with the covenant's preamble and 26 articles. Six principal organs of the United Nations were established under the charter—a general assembly, a security council, an economic and social council, a trusteeship council, an international court of justice, and a secretariat. During Aug.-Dec., 1945, a preparatory commission met in London to draw up detailed plans for the functioning of these organs, and the general assembly held its inaugural meetings in the Central Hall, Westminster, London, Jan. 10-Feb. 13, 1946. The chief business of this session was to bring the other principal organs into being. Before it adjourned, both the security council and the economic and social council had been appointed, and had started work; a bench of 15 judges of different nationalities had been elected for the international court of justice; and Trygve Lie (Norway) had been chosen as first secretary-general of the United Nations with authority to recruit the necessary staff. The election of the trusteeship council was deferred until the second part of the session, which took place in New York, Oct. 23-Dec. 16, 1946.

THE GENERAL ASSEMBLY. This is a body in which all the members, big and small, meet on equal terms. Each member may have five delegates but has only one

vote. The regular session of the assembly opens on the third Tuesday of Sept. each year, but special sessions may be convened by the secretary-general at the request of the security council or of a majority of the members.

The general assembly may discuss, and make recommendations on, any international question within the scope of the United Nations, with the one exception that, if a dispute or international situation is being dealt with by the security council, the assembly cannot intervene unless requested to do so. Essentially a deliberative organ, with powers to supervise, review, and criticise, the general assembly adopts its own rules of procedure and elects its own president and vice-presidents for each session. Most of its work is done in committees. There are six main committees, dealing respectively with (1) political and security matters, (2) economic and financial matters, (3) social, humanitarian, and cultural matters, (4) the trusteeship system and matters relating to non-self-governing territories, (5) the budget of the organization, and (6) legal and constitutional questions. In addition, procedural, standing, and *ad hoc* committees are appointed as required. All committees report to the full assembly, which is responsible for ultimate decisions.

THE SECURITY COUNCIL. This body is charged with the primary responsibility of maintaining international peace and security. It consists of 11 members of the United Nations, each of whom has one representative. China, France, Russia, the U.K., and the U.S.A., in virtue of their special position as great powers, are permanent members of this council. The remaining six non-permanent members are elected by the general assembly. Each sits for a term of two years and is not eligible for immediate re-election. Unlike the council of the League of Nations, the security council functions continuously. As watchdog over the peace of the world, its first duty is to deal promptly and effectively with any dispute or situation which is likely to endanger the maintenance of international peace and security.

Major political issues referred to the security council have concerned Persia, Indonesia, Syria and Lebanon, Spain, Greece, the British complaint against Albania regarding the mining of the Corfu Channel, the conflict between India and Pakistan over Kashmir, and the Berlin dispute between



Russia on the one hand, the U.K., the U.S.A. and France on the other.

In virtually all these cases the voting procedure in the security council was found, in practice, to be an obstacle to effective action. This voting procedure had been in the formative stages of the United Nations the subject of prolonged controversy. It was one of the points on which the great powers had been unable to reach agreement at Dumbarton Oaks. Subsequently, after the Yalta Conference of Feb. 4-12, 1945, Roosevelt, Stalin, and Churchill agreed to recommend that decisions on matters of procedure should be made by a majority of any seven of the eleven members of the security council; but decisions requiring action must have among the seven affirmative votes those of all five permanent members. This meant, in effect, that any great power could, if it so desired, exercise a veto on action. Not all the great powers—Great Britain, for example—considered this procedure in the best interests of the new organization; but for the sake of unity, they agreed to unite in urging its acceptance at San Francisco. There they were vigorously opposed by the smaller states. However, after Russia had made it plain that she regarded as vital the veto—or, as she preferred to call it, the principle of great power unity—the San Francisco conference reluctantly accepted the suggested voting procedure as the price of getting a charter. It was, nevertheless, understood that the great powers would exercise moderation in the use of the veto.

Russian Use of Veto

No sooner did the security council start to function, however, than Russia began systematically to invoke the veto in almost every problem which came before that body. Sometimes, as in the Greek question, the effect was to prevent the council from sending a commission of inquiry to the spot; sometimes, as in the Syrian-Lebanese question or the Corfu Channel dispute, the council found itself debarred from formally recommending a solution which seemed just to the majority. Russia also used the veto to prevent the admission to the United Nations of prospective members of whose applications she disapproved. During the first three years of U.N. she used the veto 28 times.

A few months of these delaying tactics in the security council made the majority of United Nations members restive. The general as-

sembly, when it resumed its first session in New York on Oct. 23, 1946, struck a warning note and strongly urged the security council to mend its ways. A year later, on the proposal of G. C. Marshall, the U.S. secretary of state, the general assembly instituted an interim assembly—popularly called the little assembly—to remain in being and bridge the gap between regular sessions of the full assembly. In the event of a single great power misusing the veto in the security council it would be possible for any seven members, as a matter of procedure, to remove the item from the council's agenda. Then the whole matter could come before the assembly, where there is no veto. Thus more use could be made of the assembly as a peace machine. In the meantime, the little assembly was instructed to study the question of "liberalising" the veto in the security council.

THE ECONOMIC AND SOCIAL COUNCIL. This is the body responsible for the constructive side of peace-making. Although some of the most enduring work of the League of Nations was achieved in the sphere of promoting international cooperation, the covenant regarded the various social, humanitarian, and technical activities of the League as sideshows. According to the United Nations conception, peace is not merely an absence of war. Peace is positive and dynamic—an opportunity for all nations to work together in every way possible to make this world a better place for men, women, and children everywhere; hence the immediate setting up of this council.

The economic and social council consists of 18 members elected by the general assembly. The term of office is three years, but retiring members are eligible for immediate re-election. There are no permanent seats reserved for great powers on this council; but in practice certain important countries can be certain of securing election. On all the international economic, financial, social, cultural, educational, scientific, and health matters with which it is concerned, the council may make or initiate studies and may make recommendations to the general assembly. It may call international conferences and prepare draft conventions. It has its own commissions, dealing respectively with (1) economic matters and employment, (2) transport and communications, (3) statistical matters,

(4) human rights, (5) social questions, (6) status of women, (7) narcotic drugs, (8) fiscal matters, and (9) population questions. Regional economic commissions have been established for Europe and for Asia and the Far East. A position of considerable importance is occupied by the "specialised agencies" which, by means of agreements, are gradually being brought into proper relationship with the United Nations. Each is responsible for spadework and planning in its own branch of international cooperation, and recruits its own membership.

Survival from the League

The international labour organization is one of these specialised agencies. Founded in 1919, it is the only part of the League of Nations structure which has survived in roughly its old form and without change of name. It considers labour conditions, industrial relations, employment, social security, and other aspects of international social policy. The food and agriculture organization (F.A.O.), born as a result of the Hot Springs conference of 1943, has as goal the raising of levels of nutrition and the standards of living of the peoples of all countries.

None of the specialised agencies has greater potentialities than the United Nations educational, scientific, and cultural organization (U.N.E.S.C.O., *q.v.*).

Other specialised agencies, either in being or planned, are the international civil aviation organization, the international monetary fund, the international bank for reconstruction and development, the universal postal union, the international telecommunications union, the world health organization, the international refugee organization, the international trade organization, and the United Nations maritime organization.

TRUSTEESHIP COUNCIL. The charter established a trusteeship system for the administration and supervision of territories placed under it by individual agreement. The system applies to territories held under League of Nations mandate; territories detached from Axis states as a result of the Second Great War; and territories voluntarily placed under the system by the states responsible for their administration. Each trusteeship agreement has to be approved by the United Nations. The trusteeship council is the body which, under the authority of the general assembly, exercises the trusteeship functions of the United

Nations. All members administering trust territories sit upon it, as do such permanent members of the security council as are not administering trust territories; the general assembly elects as many other members as may be necessary to balance the number of those who administer trust territories with the number of those that do not.

THE INTERNATIONAL COURT OF JUSTICE. This body is described under its own heading.

THE SECRETARIAT. This is an international civil service, under the control of a chief administrative officer, the secretary-general. At the first assembly it was decided to establish the h.q. of the United Nations at New York. Much of the work, however, is decentralised, and the buildings at Geneva, taken over with the other assets of the League of Nations, are used as a European centre.

United Presbyterian Church. Former separate branch of the Presbyterian Church in Scotland. It was formed in 1847 by the union of the Secession Church (*q.v.*) and the Relief Church, founded in 1750. It united in 1900 with the Free Church of Scotland (*q.v.*) to form the United Free Church of Scotland (*q.v.*) See Presbyterianism.

United Provinces. Former province of India, in 1950 made a state and renamed Uttar Pradesh or Uttar union. Its main divisions are Agra, known until 1901 as the North-Western provinces, and Oudh; and is bounded by Tibet and Nepal on the N., Punjab and Rajasthan on the W., Madhya Bharat, Madhya union, and Vindhya union on the S., and Bihar on the E. It comprises the plains of the Upper Ganges, the Jumna, and their tributaries, and adjacent hill tracts N. toward the Himalayas and S. toward the scarp of the Deccan; it includes a considerable section of the great Indo-Gangetic plain, which is divided into the Great Doab and the lower plains. The Great Doab between the Ganges and the Jumna is a stoneless, flat bed of alluvium, well irrigated and of great fertility, which produces wheat, barley, sugar-cane, cotton, millet, indigo, and opium. The lower plains produce rice.

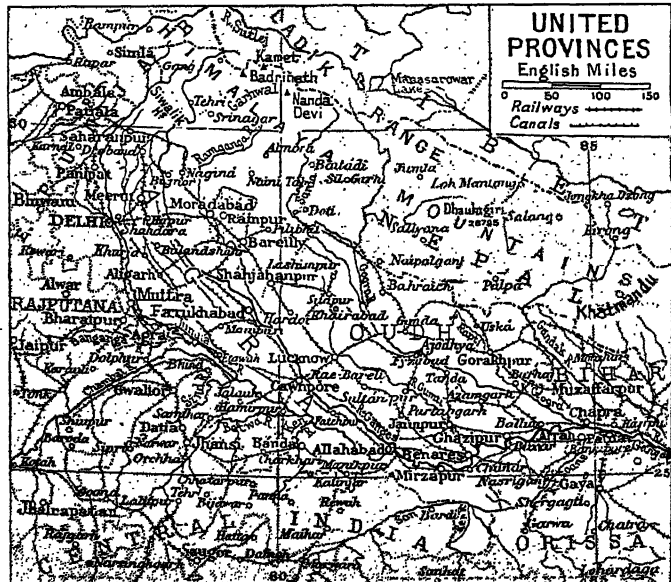
The N. mountainous area contains the Siwalik Hills and the Garhwal section of the Himalayas where are Nanda Devi, Kamet, and Badrinath peaks, all of which exceed 25,000 ft. The Ramganga, Sarda, Gogra, and Rapti flow from the Himalayas, and the Gumti from the Oudh plain, into the

Ganges from the N.; the Chambal, Sind, Betwa, and Ken reach the Jumna from the S.

In this most densely populated state of India, five-sixths of the people are Hindus; most speak Hindi, which in 1947 replaced English as the official language. There are many towns: sacred places like Benares, Muttra, and Ajodhya, ancient and modern capital cities such as Lucknow and Agra, modern manufacturing towns like Cawnpore, centres of river traffic like Allahabad, strategic towns such as Bareilly and Meerut. There are universities at Allahabad, Lucknow, Benares, and Aligarh.

Oudh was added in 1856. From 1877 the prov. was in the charge of lieut.-govs., until 1921, when it became a governorship. On the transfer of power in 1947 Mrs. Sarojini Naidu (*q.v.*) became gov., the first woman to hold such a post. Area 106,247 sq. m. Pop. (1950 est.) 61,620,000.

United Services Institution, ROYAL. British naval, military, and air force institution, founded in 1830. Housed in a building in Whitehall, adjoining the Banqueting Hall, it provides for officers of the fighting services a resort at which professional subjects can be discussed through the medium of



United Provinces, or Uttar union. Map of this state of north-central India

Before the 12th century the area covered by the Uttar union comprised many petty principalities; coherence came with the Mohamedan conquest when Mahomed Ghori, during 1176-93, occupied the whole area as far as Benares.

After the death of Aurungzebe in 1707, the district lapsed into total anarchy, Rohilkhand and Oudh achieving independence, and the Doab being only nominally under the control of Delhi. British power was first exerted in 1763 to repel the nawab of Oudh, who had invaded Bengal. By 1803 various territories in Oudh became British as the Ceded and Conquered Provinces, administered from Bengal. In 1816 N. dists. were taken from the Gurkhas, and 20 years later these areas became the North-Western provinces.

lectures, or studied with the help of a service library and a quarterly journal. The United Services Museum has a collection of naval and military trophies, relics, models, medals, pictures, prints, uniforms, badges, etc.

United Society for Christian Literature. Religious organization in Great Britain. It stimulates publication of literature devoted to Christian purposes, mainly in cooperation with missionary societies, and has produced books in more than 340 languages. The oldest interdenominational body of its kind, it comprises the Religious Tract Society, 1799; Christian Literature Society for India and Africa, 1858; and Christian Literature Society (Scotland) for China, 1884. Its London h.q. is at 4, Bouverie St., E.C.4.

THE UNITED STATES OF AMERICA

S. K. RATCLIFFE, Peterson Lecturer, N.Y.C., etc., and Others

See the articles on the mountains and rivers of the U.S.A., e.g. *Appalachians*; *Mississippi*; *Missouri*; *Rockies*; also those on the states and cities. See also *American Civil War*; *American Independence*, *War of*; and biographies of *Lincoln*; *F. D. Roosevelt*; *Washington*, and other leaders. Reference may also be made to *America*; *North America*; *Slavery*; the articles on *The First and Second Great Wars*; *Pacific War, 1941-45*; also *Negro*; *New Deal*; *Panama Canal*; *Star-spangled Banner*; *Stars and Stripes*; *Tennessee Valley Authority*, etc. A colour map faces p. 8280. For later history see N.V.

The United States of America occupies the whole of the S. part of the N. American continent, excepting Mexico. It extends from the Atlantic to the Pacific Ocean, and from the Canadian frontier to the Gulf of Mexico, the extreme measurements being from E. to W., 2,700 m., and N. to S., 1,600 m. The territory covers 2,977,128 sq. m.



The physical form of the country is roughly made up of two great mountain ranges, the Appalachians and the Rockies, neither for the most part very high, and of vast plains between them. East of the Appalachian range, however, are the Atlantic coast lowlands, a great part not more than 200 ft. above sea level, and consequently including much marshland, of which Dismal Swamp, in Virginia and N. Carolina, is the best known example. On and near the N. Atlantic coast are the most thickly populated regions, and those with the longest history of white settlement.

Development Westward

For a long time the Appalachians were a barrier to the westward extension of settlers; it was only when they were crossed and the valley of the Mississippi, with its fertile lands stretching for hundreds of miles, was colonised that the real development of the U.S.A. began.

E. of the Rocky Mts., which form the main watershed of the country, lie the Bad Lands (q.v.) and the prairie belt. The Coast Range, with the parallel inland range formed by the Cascade Mts. and Sierra Nevada, is separated from the W. coast by the narrow Pacific Slope, a fertile region with a genial climate. The broad zone between the Rocky Mts. and the Sierra Nevada consists of a high plateau, broken by depressions. It contains the Great Basin, chiefly in Utah and Nevada, a large area of internal drainage.

The Missouri-Mississippi is the most striking physical feature of the country. About 4,000 m. in length, it has a basin surpassed in

area only by that of the Amazon. In Louisiana it turns the surrounding country into a vast swamp. It also washes away to the sea millions of tons of soil every year. The Mississippi river system is by far the most important in the U.S.A.; many of the rivers included in it have a navigable length of hundreds of miles. Few of the rivers discharging into the Atlantic are navigable for any great distance; they include the Hudson, Delaware, Susquehanna, Potomac, Roanoke, and Savannah. Of the rivers draining towards the Pacific the biggest are the Columbia, Sacramento, and Colorado. In lakes the country is rich. In the N.E., close to the Canadian border, are the Great Lakes (q.v.), bodies of fresh water of vast size. Between Lake Erie and Ontario, on the river Niagara, are the Niagara Falls, of which the most impressive part is in Canada. The chief lake of the Great Basin is Great Salt Lake. In addition there are many lakes of smaller size, especially in the New England states, New York, and Minnesota.

CLIMATE AND VEGETATION. The climates vary in different regions, owing to the size of the country. In its N. regions winters are long and severe; its S. extremities lie near the tropics. But the greater part of the country is in the temperate zone, though the summers are much hotter and the winters colder than in W. Europe, e.g. in New York the temp. has varied between 102° F. and -13° F. Sudden changes of weather are frequent, and storms are of great violence. The prevailing winds of the N.W. are from the Pacific Ocean; they give the W. coast a mild and fairly uniform climate. Rainfall is abundant on this and most other coasts; inland it is mostly of smaller quantity; over the barren lands very little falls at any time of year. In Florida and Texas there are regions where tropical vegetation flourishes; in California and the states along the Gulf of Mexico and the Atlantic, as far as Virginia, subtropical plants are found.

The trees and shrubs are immensely varied. Many of the native species are unknown in Europe, but most European species

have been introduced. In the Appalachians the forests are magnificent, and flowering plants grow to perfection. On the prairies there are not many trees save willows and cotton-wood growing by the streams. The planting in this area of screens of trees as windbreaks, and to help to stop soil erosion, has been a feature of U.S. planning since 1933. The W. plains are characterised by the prolific growth of sage-brush. Forests of fir and pine abound in the Rocky mts. in which bears may still be found, though in much smaller number than formerly. The bison is nearly extinct, and the fur-bearing animals are greatly reduced in numbers. The alligator haunts the south-eastern rivers, and the rattlesnake is a pest in many parts. The N.W. rivers abound in salmon.

Marvels of Nature

In Yellowstone Park, a national reserve of territory in Wyoming, there are kept, as far as possible at liberty, many animals that used to roam the country at large, and were in danger of becoming extinct. Here are numerous geysers and hot springs, and there is a Grand Canyon, or gorge, of glorious beauty, though in grandeur it cannot compare with the Grand Canyon of the Colorado river in Arizona. Another marvel of nature, the Yosemite Valley, in California, unites the sublime with the beautiful in its cliffs and crags and waterfalls. As a general rule, the E. is the mixed farming region; the centre the maize (corn) and wheat growing belt; between the Mississippi and the Rockies the grass land area where cattle are raised in enormous numbers; while the S.E. is a cotton and tobacco-growing area.

Proceeding from E. to W., and grouping the 48 states of the Union (see table) under convenient headings, those which constitute New England are Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut. Next come three Atlantic states, New York, New Jersey, and Pennsylvania, all highly industrialised. The S. states are Delaware, Maryland, Virginia, W. Virginia, N. Carolina, S. Carolina, Georgia, Florida, Kentucky, Ten-

nessee, Mississippi, Alabama, Louisiana. In these, industries progressed slowly for a long time, but in the 20th century they have been making up for lost time; Florida in particular developed shipbuilding and aircraft making during the Second Great War. The middle west includes Ohio, Indiana, Illinois, Missouri, Iowa. The N. central states are Michigan, Wisconsin, Minnesota, N. Dakota, S. Dakota. Arkansas, Oklahoma, Kansas, Texas, and New Mexico have some southern but more western characteristics; Nebraska, Wyoming, Montana, Colorado, Arizona, Utah, Idaho, Nevada are western. The Pacific states are Washington, Oregon, California.

The smallest of the states is Rhode Island, little larger than the English co. of Durham. The largest is Texas, twice the size of the U.K. The territory of Alaska, which belongs to the U.S.A., covers 591,000 sq. m., almost all barren and mountainous. The U.S. government administrators also Hawaii, Puerto Rico, Guam, all the Pacific islands formerly under Japanese mandate, and some of the West Indian and Samoan islands. The Panama Canal zone is under its authority.

Distribution of Cities

Cities are well distributed throughout the country; there are more than a dozen towns with over half a million inhabitants, and smaller ones have multiplied exceedingly since the 20th century began. In the New England states the chief centres of population are Boston, with three-quarters of a million people; Providence, Worcester, New Haven. In the next group come New York, the commercial capital, with seven and a half million inhabitants; Philadelphia, third city in the Union (1,931,334), Pittsburg, Buffalo, Newark, and Jersey City. Of the S. cities the chief are Baltimore, New Orleans, Washington, Louisville, Atlanta, Birmingham, Richmond, and Memphis.

The cities of the middle W. are headed by Chicago, the second city of the U.S.A. (3,396,808); St. Louis, Cleveland, Cincinnati, Kansas City (Mo.), Indianapolis, Columbus, Toledo. In the N. central states are the twin cities of St. Paul and Minneapolis, Detroit, fourth city (1,623,452), and Milwaukee. In the W. and S.W., cities are less frequent and smaller; chief among them are Denver, Omaha, San Antonio, Salt Lake City. In the Pacific states, conditions have produced

THE 48 STATES OF THE AMERICAN UNION

State	Area sq. m.	Pop. (est.) 1945	Capital	Admission to Union
Alabama	51,078	2,812,301	Montgomery	1819
Arizona	113,580	630,298	Phoenix	1912
Arkansas	52,725	1,779,817	Little Rock	1836
California	156,803	8,822,688	Sacramento	1850
Colorado	103,967	1,120,595	Denver	1876
Connecticut	4,899	1,786,300	Hartford	1788
Delaware	1,978	286,832	Dover	1787
Florida	54,262	2,385,917	Tallahassee	1845
Georgia	58,518	3,191,766	Atlanta	1788
Idaho	82,808	500,109	Boise	1890
Illinois	55,947	7,721,099	Springfield	1818
Indiana	36,205	3,437,745	Indianapolis	1816
Iowa	55,986	2,259,526	Des Moines	1846
Kansas	82,113	1,740,379	Topeka	1861
Kentucky	40,109	2,578,179	Frankfort	1792
Louisiana	45,177	2,456,057	Baton Rouge	1812
Maine	31,040	785,913	Augusta	1820
Maryland	9,887	2,125,419	Annapolis	1788
Massachusetts	7,907	4,183,179	Boston	1788
Michigan	57,022	5,471,774	Lansing	1837
Minnesota	80,009	2,497,485	St. Paul	1858
Mississippi	47,420	2,080,377	Jackson	1817
Missouri	69,270	3,556,693	Jefferson City	1821
Montana	146,316	457,624	Helena	1889
Nebraska	76,653	1,198,492	Lincoln	1867
Nevada	109,802	159,804	Carson City	1864
New Hampshire	9,024	452,174	Concord	1788
New Jersey	7,522	4,200,941	Trenton	1787
New Mexico	121,511	535,220	Santa Fé	1912
New York	47,929	12,584,913	Albany	1788
North Carolina	49,142	3,504,626	Raleigh	1789
North Dakota	70,054	526,935	Bismarck	1889
Ohio	41,122	6,873,448	Columbus	1803
Oklahoma	69,283	2,034,460	Oklahoma City	1907
Oregon	96,350	1,206,322	Salem	1859
Pennsylvania	45,045	9,193,957	Harrisburg	1787
Rhode Island	1,058	758,222	Providence	1790
South Carolina	30,594	1,905,597	Columbia	1788
South Dakota	76,536	555,347	Pierre	1889
Tennessee	41,961	2,878,777	Nashville	1796
Texas	263,644	6,786,740	Austin	1845
Utah	82,346	616,989	Salt Lake City	1896
Vermont	9,278	310,352	Montpelier	1791
Virginia	39,899	3,079,706	Richmond	1788
Washington	66,977	2,088,574	Olympia	1889
West Virginia	24,090	1,724,677	Charleston	1863
Wisconsin	54,715	2,952,205	Madison	1848
Wyoming	97,506	246,766	Cheyenne	1890
District of Columbia	61	938,458		1791

many large towns: Los Angeles, San Francisco, Seattle, Portland, Oakland, Spokane. The city of Washington, the capital, where the president resides, congress meets, and the gov't. offices are, has a pop. of 663,091 and is in a special area, about half the size of the Isle of Wight, created to contain it; this is called the District of Columbia (D.C.).

POPULATION. The est. pop. of the U.S.A. in 1947 was 142,673,000. Est. pop. of the various states in 1945 is shown in the accompanying table. Anglo-Saxon stock still appears to predominate, although a greater total of people are of other stocks, German, Scandinavian, and S.E. Europe having contributed very largely to the American nation. Among foreign-born and first generation U.S.-born, Germans (5,236,612), Italians

(4,594,780), Canadians (2,910,951), Poles (2,905,859), Russians (2,610,244), Irish and Eireann (2,410,951), English (1,975,975), Swedes (1,301,390), Austrians (1,261,246), and Mexicans (1,076,653) were in 1940 the most numerous. In certain cities there are quarters where English is scarcely heard. New York City includes persons of at least 70 national origins. Yet the process of transforming all these various elements into Americans—the biggest single influence in which is the public (elementary) school—goes on steadily. In the second generation they become indistinguishable from those whose families have been American for generations. Only the French Canadians, of whom there is a considerable element in New England and near New Orleans, resist absorption.

American (Red) Indians, the people who inhabited the land when the first white men arrived, never numbered more than a few million, and were sparsely scattered, living for the most part a nomadic life as hunters, except in what is now New Mexico and Arizona, where they had settled communities. Treated by the white settlers even as late as the 1880s as little better than vermin, and like vermin better dead, they appeared in the last years of the 19th century likely to disappear; but a more enlightened approach to the remnants left of their civilization, the strict setting aside of reservations of land for them, and laws forbidding the sale of alcohol in their reservations have effected a change, and their number in 1940 was 333,969 compared with 244,437 in 1900. Although military service was not compulsory for them, many served in the armed forces during the Second Great War.

The Negro in S. and N.

The negroes, descendants of Africans imported as slaves, numbered about 1,200,000, or nearly 25 p.c. of the pop., when the slave trade stopped in 1807; in 1940 they numbered 12,865,518, or nearly 11 p.c. of the pop. Their birth rate is about 24 per thousand, while the white birth rate is about 18.5, so that, although their expectation of life is 50 years instead of 60, following the drastic cut in white immigration in the 1930s there is a tendency for the proportion of negro to white to rise again. Three-quarters of the negroes live in the southern states, where in some areas they constitute 50 p.c. or more of the pop. In the S. they live in separate districts, and are restricted to their own schools (inferior to those of the whites), churches, theatres, and special seats in public conveyances. It was to raise the status of these negroes, and of the poor whites in the S., deprived by state laws or intimidation of most of the rights which the constitution confers on all U.S. citizens, that President Truman insisted on states rights in his 1948 election campaign; and it was this stand by the president that led to the "Dixiecrat" revolt against the Democratic party in the states of Ala., La., Miss., and S.C. There is a progressive spread of negro pop. northwards, where there is still, though less, discrimination—e.g. a negro is usually paid less, even when he does the same work as a white man—but,

though in explosive centres of mixed pop. such as Detroit, there may be "race riots," lynching does not occur, and there is no discrimination in theatres, trains, etc.

GOVERNMENT AND CONSTITUTION. The country, a federal republic of 48 sovereign states, is bound together by the pact of 1787, put in force in 1789. It has a written constitution; each state has a similar fundamental law.

The federal govt., from its seat at Washington, deals with only such matters as the states have delegated to it, and each state retains complete authority over all unenumerated categories. The govt. looks after foreign relations, customs, army and navy and dependencies, and controls interstate trade, post office, currency, bankruptcy, and patents. The tendency is for an extension of federal authority, and the average citizen comes steadily more in contact with it. The ordinary civil and criminal law is a state matter, but income tax, suits between residents of different states, and the majority of banks are under the control of Washington.

The principle of the separation of powers underlies both federal and state constitutions. Executive officials, like the president and state governors, being elective and as truly representative of the people as members of congress or the state legislatures, have definite powers, with which the lawmakers cannot interfere. On the other hand, the legislatures are under no obligation to pass measures the executive desires. A lack of teamwork frequently results. Laws get on the statute-books which the executives neglect to enforce; the president or a governor finds his favourite policy foiled by want of the legislation or the appropriations it requires. Clashes are frequent, and the executive veto power, obsolescent in England, is active in the U.S.A., although a legislature can usually override it by a two-thirds vote.

Four-Yearly Presidency

The president and vice-president are elected every four years and are irremovable, except by impeachment, a process only once, and then unsuccessfully, tried. They are selected by a college of electors, which has in theory unlimited powers of choice; practically, as the electors are themselves elected under pledge to support definite candidates, they are elected by the direct vote of the people. Presidents can be re-elected; until the presidency of F. D. Roosevelt, it

was an accepted convention that no man stood for a third term.

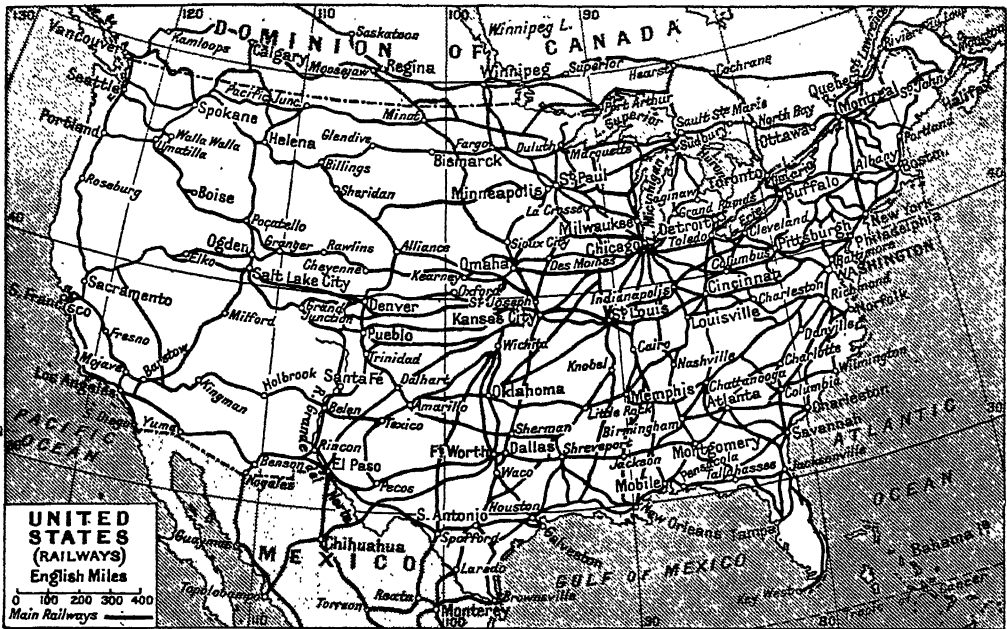
The vice-president presides over the senate, and, in case the president dies, fills out his term. Unless that occurs, his position was dignified but as a rule not very important, though some presidents, e.g. Harding, have given the vice-president a seat in the cabinet. Six vice-presidents have succeeded to the White House.

Cabinet and Congress

The president is commander-in-chief of the army and navy, and until it comes to treaty-making is supreme in foreign affairs. He cannot initiate legislation, but by his message to congress he can awaken the country to the need of particular reforms; and he can, within ten days of its passage, veto any bill. Moreover, as the official head of the administration, he can decide upon the zeal with which different classes of law are enforced. In time of war or other grave crises, he is expected to assert himself as head of the nation, and the prestige of his office makes him almost an autocrat.

Cabinet members cannot sit or speak in either house of congress, and are merely the president's personal assistants. Subject to the assent of the senate, usually quite perfunctory, he can select whom he pleases and can dismiss them without facing a political crisis. Concurrence by the senate is requisite in all important appointments, such as to embassies or the federal bench, and concerning lesser offices the president is expected to consult the local senators concerned. This at once extends and checks presidential power, and provides a link between the executive and the legislature. His power of patronage arms the president with a lever to enable him to get his favourite measures through congress, and it also keeps him—for he is normally head of his party as well as of the national government—in touch with the people's representatives.

By his foreign policy the president can bring the country to the brink of war, but congress alone can declare it and grant money for it. The president cannot conclude a treaty except "by and with the advice and consent of the senate," and that by a two-thirds majority of the senators present. Negotiations and the formal ratification of a treaty, after it has been approved by the senate, are entirely in the president's hands; but the senate is



United States of America. Map showing the network of railways which traverse the continent and connect the industrial centres with all parts of North America

always jealous of its right to reject, amend, or add reservations to treaties before they are executed; moreover, if financial questions are involved, the approval of the house of representatives is invariably considered necessary.

The senate, representing the states as sovereign entities, has 96 members—two from each state, regardless of its size or pop.; the house consists of 435 members, or congressmen, distributed among the states proportionately to pop. Senators sit for six years. One-third are elected every second year; the life of the senate is thus never interrupted. Congressmen are elected for two years, a general election being held every presidential year and again two years later.

Despite the presence of many distinguished men in the lower house, the longer term and greater power of the senate attract to it the majority of U.S. politicians corresponding to the British "front bench men." A man having served as a congressman will often seek, and secure, election as a senator. Senators may express their views with a violence unknown to the British parl. system, and much of the complexity of U.S. politics is due to the importance attached to the personal, as distinct from the party, opinions of leading senators. The senate is much better adapted to serious debate

than the house of representatives with its vast hall, but as its rules do not include the "closure," the opposition at the close of a session often fights a measure by a "filibuster," i.e. by talking it out.

Powers of Committees

Numerous committees are set up, each of which decides the fate of all bills before it. In the senate the committee on foreign relations, in the house the committees on ways and means, appropriations, and rules are among the most important. Debates on the ordinary measures are brief but full dress discussions on foreign affairs in the senate, and on taxation and appropriations in the house, are detailed and interesting. The immense power of the speaker of the house, always the representative and virtually the leader of the majority, springs as much from his right to nominate committees and their chairmen as from his control of bills, once they are returned to the house. It is an unwritten rule of these committees that the chairman is the member having uninterrupted seniority of membership in the senate or the house.

To these committees the recommendations of the executive come. The navy dept., for instance, prepares a shipbuilding programme: the secretary of the navy and his experts come before the committee on naval affairs and urge its desirability; the committee then de-

cides what is to be done, reducing and altering the plan according to its own ideas, to the grant it can get from the committee on appropriations, and to the general political situation.

In other ways, nevertheless, congress is far less powerful than the British parliament. Its authority is strictly limited by the constitution. That document lays down certain definite principles which every statute must observe. Repeal of a federal statute requires a two-thirds majority in both houses and the assent of three-quarters of the state legislatures. All the states have two-chamber legislatures except Nebraska, which in 1934 in an amendment to the state constitution adopted a single chamber legislature.

Should any act of congress or the state legislatures infringe the constitution, the supreme court of the U.S.A. does not hesitate to declare it *ultra vires* and void. Composed of judges nominated by the president with the concurrence of the senate and irremovable save by impeachment, the supreme court is a body of the highest prestige. It is in theory above political strife, but a renewed bench of judges has sometimes accepted a law similar to one declared unconstitutional by an earlier court.

To work institutions of the complexity just described and to make

it possible for a democracy of more than 140,000,000 in a territory of nearly 3,000,000 sq. m. to carry on, extra-constitutional organizations of great efficiency are needed. These the two principal parties, the Republican and the Democratic, provide. Each maintains a network of committees, which covers the entire country and deals indifferently with federal, state, and municipal issues. It focuses opinion on each question as it arises, and by mobilising public opinion puts pressure on the party office holders, and thus serves to keep them in line with the views of the organization.

The system is seen in its most elaborate form at the great national conventions, at which each party chooses its presidential candidate every four years. Delegates from each state, selected by the rank and file of the voters of the party concerned, meet and decide on the men and the "platform" they will support. To enable these assemblages of over 1,000 men to reach a decision much direction is necessary; compromises between rival interests must be reached, and there is room, and indeed a necessity, for much wire-pulling. The "machine" may seem to exert almost autocratic power, but it is always susceptible to the trend of popular feeling, and never forgets that the convention may at any time be "stampeded" against its wishes in favour of some individual or policy which has caught the public ear.

But, when all is over, the party candidates and policy have been determined and party managers have a shrewd idea of how far and in what direction their followers will permit them to go. The executive officials complete as is their authority within their own spheres, are usually careful to conform to the understanding arrived at, and are thus able to count on the cooperation of the legislators of their own party in carrying out the programmes on which they embark. A compromise has, in fact, been established between the executive and, legislative branches of the government, in spite of the constitutional "separation of powers," and if it breaks down, the party national committee remains in being until the next national convention meets, to advise or admonish as the case may require.

EDUCATION AND RELIGION. The public control and regulation of education are the concern not of

the federal govt. but of the states, each of which alone has the power of educational legislation and administration within its own borders. At Washington there is a section of the federal security agency entitled the office of education, but its functions are confined to the collection and publication of statistics and the diffusion of useful information respecting the organization and management of schools, methods of teaching, etc. There is consequently a great diversity in educational systems and conditions in different parts of the country. Thus, while every state has enacted a compulsory school attendance law, the number of days in the year when children are required to attend is much lower in some of the southern states than in New England.

The public school (or common school) in the U.S.A. corresponds to the English council school, being a school, whether elementary or secondary, that is under public management. A school of the type of the English public school is called in the U.S.A. a private school. The U.S. preparatory school is not one where young boys are prepared for an American equivalent of an English public school, but is roughly equivalent to the English public school itself. A parochial school is one organized and maintained by a religious body, most frequently R.C. The classes in U.S. elementary schools are called grades, and are taught by grade teachers.

Higher Education

The U.S.A. has some 700 universities and degree-granting colleges, some for men, some for women, and some for men and women. Many of them are state institutions, established by the state, supported by state funds, and controlled by the state legislature; and a number are not of a standard which would warrant the title university outside the U.S.A. There are some 250 professional schools, again some for men, some for women, and some for men and women. Institutions of higher education include also junior colleges and teachers' colleges.

Illiteracy is not common except in the S.: more than a third of all Ky. children do not finish their elementary schooling, and in all the S. states the percentage of conscripts rejected during the Second Great War on account of illiteracy was high.

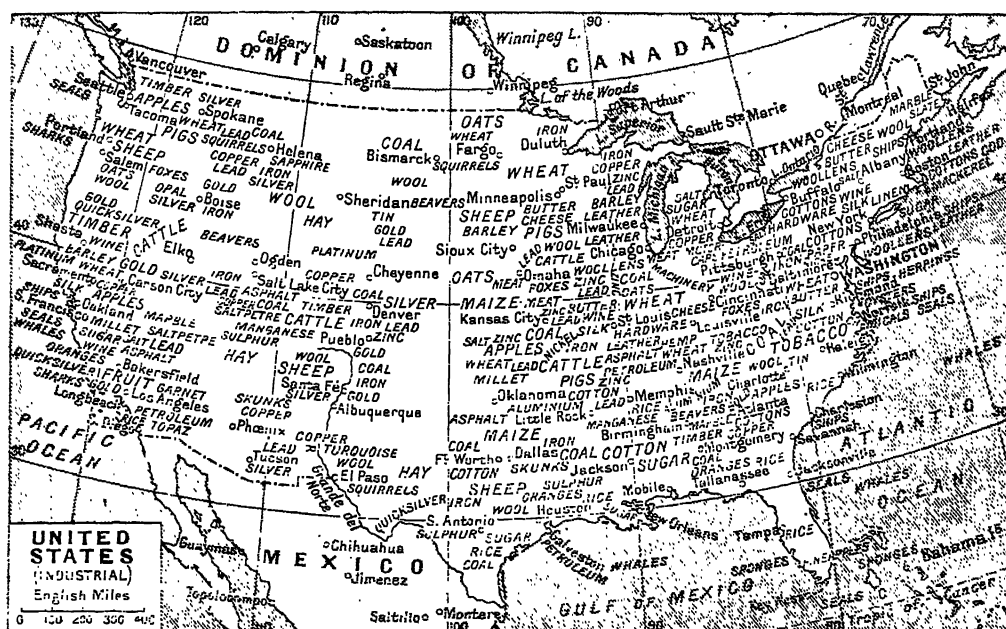
That the vast majority do read a great deal is proved by the huge

sale of newspapers, magazines, and many kinds of books.

Of the religious communities the R.C. has the largest number of adherents (20,000,000), although the population is overwhelmingly Protestant. But the Protestants are divided into a great many sects, of which the Baptists (8 million), and the Methodists (7 million) are the largest, Lutherans, Presbyterians, Protestant Episcopal Church, and Disciples of Christ coming next in order.

MINERAL RESOURCES. Development of the U.S.A.'s mineral resources began only about the middle of the 19th century; but, despite their vastness, intensive and unrestricted exploitation and the immense demands made by the two Great Wars have eaten into her metals to an alarming degree, so that she has become a great importer of these products. The most widely distributed mineral is coal, found in 30 of the states, and over an area of some 335,000 sq. m. The most productive coal mines are in Penn., with Ohio next, followed by Ill. and W. Va. Most of the coal is bituminous; anthracite is found only in Penn.

Next in importance comes iron; this is very widely distributed, but the largest deposits have been those close enough to the surface to be simply shovelled up in the "ranges" (districts) in Michigan and Wisconsin near Lake Superior, where, however, the ore is expected to be exhausted by 1975. In both coal and iron mining the use of machinery is intensive. Production of iron ore in 1946 was 40 million tons, valued at \$1,103 million (£276 million). Copper as well as iron has been mined in the Lake Superior region in immense quantities; it is found also in Ariz., Mont., Utah, and Calif.; in 1946 535,000 tons were produced, valued at \$172 million (£43 million); but it has been estimated that the mines will be exhausted by 1960. Next in value of annual production comes aluminium, of which 365,000 tons valued at \$116 million (£29 million) were produced in 1946. Production of lead, of which the U.S.A. was once the world's most prolific source, at 282,000 tons in 1946 was only about half the production in 1925. Quicksilver is profitably mined, chiefly in Calif. Silver worth \$17 million (£4,250,000) and gold worth \$51 million (£14,750,000) were produced in 1946, the first chiefly from Col., Utah, Mont., Nev., and Ida., the second from Calif., Col., Nev., S. Dak., and Alaska.



United States of America. Map showing the distribution of natural products and the consequent industrial and agricultural centres, some of which are still in course of development

The U.S.A. remains by far the world's largest producer of petroleum (*q.v.*); it has been estimated, however, that known sources will be exhausted before 1970. Natural gas, consumed in 1946 to the value of \$885 million (£221 million), is a cognate product.

Sapphires (Mont.), turquoises, garnets, rubies, and other precious stones are found.

AGRICULTURE. The farming pop. in 1947 was estimated at 27,550,000 (compared with 31,614,269 in 1900). Farming remains, however, the largest single industry in the Union, giving employment in 1940 to 17.6 p.c. of workers (compared with 53 p.c. in 1870). Conditions changed materially between the years before the First Great War and the years following the Second. In the early part of the 20th cent. the happy-go-lucky era when a man who had exhausted the fertility of one farm moved on to another stretch of virgin territory was already virtually at an end; but the attitude of mind based on the assumption that such migration was possible remained, and it was not until the 1930s that the American people as a whole realized how much the fertility of their most fertile land was decreasing, and that, there being no more land to be brought easily under cultivation, it was necessary to conserve what they had and put into it humus and fertilisers.

Two areas in particular felt this change: the Middle West and the S.E. During a succession of dry years from 1935 to 1942, the violent winds that sweep across the vast plains of the Middle West, uninterrupted by any west-east hill range, caught up and carried away the soil of 40,000,000 acres, and badly damaged the land in half the remainder of the 400,000,000 acres under cultivation there. Before white settlement the soil had been held down by the roots of coarse grasses and weeds; the white rangers' cattle and sheep grazed this herbage almost to extinction; its roots were dug out and destroyed, and for years the soil, without fertilisers or intensive culture, yielded crops of wheat and Indian corn. The continued cropping with one product seriously reduced fertility; the complete absence of crops, *e.g.* clover, with roots which would hold the soil together allowed it to become dust. The planting of banks of trees to break the wind, and the introduction of clover and other run-rooted crops to get fibre back into the soil, followed the disastrous drought of 1935-42; but millions of acres were beyond repair.

Much of the soil in the cotton-growing areas of the S.E. has also suffered from erosion. Cotton bushes are planted in rows, and the soil between is cleared of weeds (the roots of which would hold it

together). Much of the cotton country is hilly. When the rains come, and they are heavy in this area, the soil is washed away.

In the longest settled states, in the N.E., where mixed farming on the European model has always obtained, there is no such serious problem of erosion.

Changes in Cotton Culture

The acreage under cotton fell from about 45,000,000 in 1929 to less than 18,000,000 in 1946, chiefly because of the displacement of cotton by synthetic fibres. This change, and the introduction of machinery, in particular for picking (the machine can pick 30,000 lb. in 24 hrs., a man 120 lb. in 8 hrs.), have produced a revolution in the cotton area where, it has been estimated, 5,000,000 fewer workers will be required in 1955 than were needed ten yrs. earlier. Some of the cotton lands come within the area controlled by the Tennessee Valley Authority; and there, and in other areas with state and federal encouragement, terracing has been introduced, orchard growing, livestock rearing, and general farming are being developed, and lands no longer suitable for agriculture are being re-afforested. These changes are contributing to an improvement in living conditions in the area, and helping to absorb some of those displaced by changes in cotton culture.

The proportion of owner-farmers to tenant farmers fluctuates, an increase in tenant farming indicating bad times when the owner-farmer either fails to keep up mortgage payments or is forced to sell in order to procure necessities. The vulnerability of the farmers in bad times is being gradually reduced by the turning away from monoculture to general farming, which provides more of a family's necessities from the farm itself. In 1945, 3,301,361 farmers owned the farms they worked, 1,858,421 were tenants, 660,502 part owners, while 38,885 farms were worked by managers. The worst rural slums in the world are to be found in the cotton-growing areas, where many of the farms are worked by negro and white tenant farmers and sharecroppers. In this area the tenant farmer as a rule pays no rent; he provides tools, a team, and labour, and gives his landlord a share of his harvest—usually half. His home is rarely better than a ramshackle hut, with no running water or other amenity; his income is perhaps one bale of cotton, worth about £25. The sharecropper contributes nothing but his labour. His home may be a hovel constructed of packing cases and corrugated iron; and his children constitute a large part of the illiterates of the S., for since he cannot clothe them they cannot attend school. In 1940 a third of all farms in Kentucky were valued at less than £75.

Of the crops widely grown maize is the heaviest, the total in 1946 being 3,288 million bushels from 88,718,000 acres, compared with an average of 2,608 million bushels from 91,698,000 acres during 1935-44. It is grown chiefly in the middle Missouri-Mississippi valley, Iowa producing most. Wheat comes next in acreage—1,155·7 million bushels from 67,201,000 acres in 1946, compared with an average of 843·7 million bushels from 55,404,000 acres during 1935-44. This indicates how U.S. wheat production was increased to help make good the shortages caused by war devastation in Europe and by drought elsewhere. Most wheat comes from the Middle West, to the N. of and overlapping the maize belt, Kansas giving the heaviest yield (216,667,000 bushels in 1947). Oats, nearly 1,510 million bushels from 43,648,000 acres, was the second largest crop in 1946; most of it is used for stock feeding on the farms. Other important crops are rye, barley, soya beans (an increasing crop), flax seed, rice, potatoes, sugar cane, sugar beet.

Cotton production in 1946 was 8,724,000 bales of 500 lb. gross, Texas with 1,750,000 bales providing most. Tobacco output was 2,247·7 million lb. in 1946, compared with an average of 1,479·6 million lbs. during 1935-44; N. Carolina, with 896 million lb., had the heaviest crop.

The total value of live-stock in 1946 was estimated at \$8,922,763,000 (approx. £2,230,690,000). Horses, mules, milk cows, sheep, and pigs all showed a reduction in numbers in 1947 compared with 1946; cattle showed a slight increase. Farm and factory butter production amounted to 1,706 million lb., cheese production to 1,115 million lb., condensed and evaporated milk to 4,107 million lb.

INDUSTRY. While the great coal mining districts of Penn. remain the chief centre of heavy industry of the U.S.A., the creation of sources of electric power by the construction of great dams on the Columbia (Bonneville and Grand Coulee) in the west and on the Tennessee and its tribs. in the east, coupled with production need during the Second Great War, led to the development of industry in areas formerly devoted to agriculture or forestry. The Kaiser shipyards at Vancouver, the Boeing aeroplane works at Renton and Seattle, and the plutonium plant at Hanford, which produced the core of the first atomic bombs, are outstanding examples of such new plants planned by Washington.

Principal Manufactures

Production of synthetic rubber went up from 8,383 tons in 1941 to 820,373 in 1945, reduced in 1946 to 740,026 tons when natural rubber began once more to be available. Output of steel, centred in Pittsburgh, in 1946 was estimated at 59 million tons. Motor vehicles in normal times top all other products in total value; the great metropolis of this industry is Detroit. Meat packing, petroleum refining, cotton weaving, woollen manufacture, tobacco manufacture, and the production of animal feeding stuffs are other important industries. Electric power used in 1946 totalled 269,772 million kWh., nearly a third of it hydro-electric.

Of the forests suitable for exploitation the federal govt. owns about 89 million acres, state and lesser public authorities 27 million acres, 345 million acres are privately owned. Annual consumption of timber is at an average of 13,660 million cu. ft.: annual growth is estimated at 13,370 cu.

ft. Vast areas are swept by fires every year—20·7 million acres being lost in 1946. Some replanting is carried out: 520,000 acres in 1940, last pre-war year for the U.S.A., 150,000 acres in 1946.

COMMUNICATIONS. The first rly. was started in the U.S.A. in 1828; by 1830 there were 23 m. of rly. Atlantic and Pacific were linked when the Union Pacific railroad met the Central Pacific in 1869; mileage in 1870 was 52,922. Maximum mileage was 266,381 in 1916, reduced to 240,156 by 1945. Except E. of the Great Lakes in the area of longest settlement, rly. communication from E. to W. is much better than from N. to S., owing to the fact that the rlys. were for the most part constructed in pioneering days when the urge to the westward caused them to be built. More than 45,000 locomotives were in use in 1946, and railway workers numbered nearly 1½ million.

The great length of journeys in the U.S.A. has stimulated internal air transport, which provides regular services between all large centres of pop. Domestic airlines operating 696 aeroplanes flew 207,347,325 m. in 1947; 8,095,833 passenger journeys were made; international lines with 163 aircraft flew 55,852,717 m. Total number of airports in use was 5,431, of which 319 were designed for long distance aircraft.

Rivers and canals are important, particularly for transport of goods. The Mississippi and its great trib. the Ohio have long been highways into the interior; the canal system connecting the Great Lakes with New York has an immense traffic; the T.V.A. has made the Tennessee navigable, turning into busy river ports townships formerly almost dead. Sea going vessels owned in the U.S.A. increased from 1,379 of 1,000 tons or over of deadweight tonnage 11,681,700 in 1939 to 4,888 of 50,780,000 in 1946, giving the U.S.A. the greatest merchant marine on the world.

HISTORY. Not for nearly a century after Columbus's discovery of the W. Indian islands was any systematic colonisation of them, or of the mainland discovered later, attempted. In 1565 the Spaniards started a settlement in Florida, but not until the 17th century did emigration from England begin. It was conducted under the auspices of a company chartered in 1606, to which powers to colonise and trade in what is now Virginia and the neighbouring states were given. Settlers

founded Jamestown in 1607, and with other settlements this was formed a little later into the colony of Virginia, a proprietary province. These emigrants were for the most part people of good family, who remained loyal to the Stuarts when the struggle came, and gave their society an aristocratic tinge.

Meanwhile the Plymouth Company was making settlements along the north-east seaboard. Emigrants landed at Plymouth Rock in 1620, and in 1629 the colony of Massachusetts Bay was established. The troubles in England led to the arrival in America of persons, most of them of Puritan sympathies, who were dissatisfied with the conditions at home, and these settlers founded the colonies of Connecticut, Rhode Island, New Hampshire, Vermont, and Maine. The colonists had their own religious quarrels, frequently very bitter, but external pressure united most of them in 1643 in a confederacy called the United Colonies of New England, a name given to this district. Later Pennsylvania was settled by Penn and his followers, and N. Carolina, S. Carolina, and Georgia came into existence.

In the New England colonies democratic institutions existed from the beginning; in Virginia they were introduced about the time the Puritans landed. Yet the colonists remained generally content to be under the English government, with outbreaks now and then against what they considered to be stupidity or oppression. In 1664 the Dutch settlement of New Holland in and around New Amsterdam (now New York) passed under English rule; the wedge between the two English sections was thus removed.

Resistance to British Taxes

During the 18th century the struggles between Great Britain and France, which made Canada British, involved the American colonists in continuous warfare. At the end of the struggle they were left more to themselves, and began to think of their interests apart from those of the mother country. Therefore, when the British government, being in need of money, attempted to tax them, they protested, and even resisted violently. To the Boston riots (*q.v.*) parliament replied by punitive measures, some of which altered the charter of Massachusetts. George III was chiefly responsible for the attempt to coerce the American colonies; a

large body of opinion was hostile to it, but he found subservient ministers, and had a majority in the house of commons.

By 1774 the colonists were behaving as an independent people, but they had not yet reached the stage of repudiating British authority altogether. All they wanted



United States of America. Map of the original seaboard states which declared their independence July 4, 1776

was to protect themselves against what seemed to them to be attacks upon their liberty and unconstitutional efforts to take away their rights. The story of the war that followed is related in the article, American Independence: the War of 1775-83. In 1776 the colonists declared that they no longer recognized the royal authority, and in the declaration of independence proclaimed themselves free and independent states.

In 1778 the French government openly recognized the new nation, and made an alliance with it, at once sending ships and men to take part in the war. It was not until 1781, however, that the capture of Lord Cornwallis's army brought the end of what U.S. citizens called the war of the revolution in sight: in the next year peace was made. Now came the difficulty of framing a constitution and the even greater difficulty of finding money with which to carry on the government of the new republic. Thanks largely to Alexander Hamilton, a federal form of union was adopted: the constitution framed under his influence has remained in force ever since. In 1789 General Washington took office as first president, and the new congress set to work. The first political contests occurred between the Federalists, who were for firmly exerting the authority of the

central government over the states, and those who would have interpreted the constitution more liberally. The latter called themselves Democratic Republicans, and so the Democratic party came into being.

During the Napoleonic Wars, Britain aroused the resentment of the Americans by several acts which were considered high-handed, such as searching ships for contraband, and pressing men who claimed American citizenship into the naval service. Under the leadership of Henry Clay, an agitation was got up for going to war with England, and in 1812 war was declared. To the surprise of the world, the American navy showed itself superior to the British in both gunnery and seamanship. On land, however, the British were more successful, and the war dragged on until the end of 1814. Among its other consequences was the extinction of the Federalist party, which had been opposed to it and to the government which was carrying it on. This led to accusations of lack of patriotism; henceforward the central administration was admitted by everybody to be entitled to exercise very wide powers and the right of the states to individual action was limited. This intensification of national feeling made it easy for President Monroe to put forth in 1823 his famous doctrine that no European power should acquire territory in the American continent.

Tariff issues broke up the national harmony, and the state right party became more insistent, some states maintaining that a tariff which did not suit their interests was unconstitutional, and claiming the right to secede at will from the Union.

War with Mexico, 1846-48, arose out of the support given by the Americans to Texas, which was striving to free itself from Mexican rule. The U.S. troops won a series of victories, and as the result of the war the far west was added to the Union, N. California, as well as New Mexico and Texas, being given up by Mexico.

Just after this gold was discovered in California, and the rush to the diggings began, 1849, the effects of which made a noticeable difference in the development of the country.

The question whether slavery should or should not be permitted in the new territories taken from Mexico caused a fresh alinement of political parties. The Democrats

now made it one of their chief aims to perpetuate slavery; against them were arrayed the Republicans—at first called National Republicans—and so fierce were the emotions on the one side of those who were anxious to prevent the spread of slavery and on the other those whose way of living depended on slave labour, that there was talk even then of civil war. From this time the north showed active sympathy with the slaves, helping them to escape from their southern masters and openly working for the abolition of slavery. Feeling became bitter, and in the south separation was talked of as certain.

Thus matters stood when, in 1860, the Republican Abraham Lincoln was elected president. He announced in his inaugural address that he had no right and no intention to interfere with the institution of slavery where it already existed, but he also declared that no state could lawfully leave the Union. This raised again the question which had been so long debated as to whether the federal government had authority over states which declared themselves unwilling any longer to acknowledge it as supreme. Lincoln avowed his determination to coerce the south into remaining within the Union; the southern states, which formed themselves into a confederation, believed themselves strong enough to prevail in war, which broke out in the spring of 1861 (*see American Civil War, 1861-65*). The primary issue was not slavery; it was the old quarrel between the Federalists and the upholders of state right. Yet the result was to free the slaves, for, as a war measure, Lincoln, in 1862, proclaimed all the slaves in the rebel states free. This only inflamed the southerners, or Confederates, to greater efforts, and for two years the balance was even. Then the north, contrary to the world's expectations, began to gain ground steadily. It had command of the sea, and established a blockade of the S. ports. The S. rlys. had been badly damaged; it became more and more difficult for the south to feed its troops and move them about. At last, in 1865, the Confederate forces surrendered, and Lincoln's aim was accomplished: he had prevented the Union from being broken up.

But the Civil War left the southern states devastated as no great stretch of country had been since the Thirty Years War. President Lincoln, with great

wisdom, advocated allowing the vote to any southerner who would swear allegiance to the United States; and the readmission to the Union of any southern state in which 10 p.c. of the population thus enfranchised could set up a govt. He wanted the negroes to be freed and educated, without immediate enfranchisement. But he was assassinated before he could carry through his policy, and though his successor, Andrew Johnson, sought to follow Lincoln's lead, he was not strong enough to sway congress in that direction. Instead, congress decreed that any southerner who, after taking an oath of allegiance to the constitution, had taken up arms against it, was debarred from voting. This meant that, with few exceptions, the educated men of the S. were ineligible to vote. The negroes, on the other hand, were at once enfranchised by the Civil Rights Act of 1866, strengthened by the 14th amendment to the constitution (1868), which declared all freedmen to be citizens of the U.S.A. with the same civil rights as white persons. The negroes and the poor whites—equally untrained in political judgement—were the arbiters of the fate of the S. through more than five years during which their votes were manipulated by corrupt politicians from the N., popularly known as "carpet-baggers." The conditions that arose from the abandonment of Lincoln's wise policy did more to perpetuate the hatred of the S. for the N. than all the disasters of the war itself. Not until the Amnesty Act of 1872 were the south's natural leaders allowed to re-emerge. Complete amnesty was not granted till 1898, after the outbreak of war with Spain.

Problem of the Freed Negro

As the S. began to recover politically, the practical disfranchisement of the negroes began. The 15th amendment (1870) decreed that no man might be debarred from voting on account of race, colour, or former condition of servitude; but the southern states got round this by introducing literacy and other qualifications of voting. The abolition of slavery revealed another problem: that of the negro himself and his position in a country where he was in a substantial minority (*v.s. Population*).

Up to the time of the Civil War, the U.S.A. was mainly an agricultural country. But necessities of war led to the development of

industry on a considerable scale. Before the Civil War, customs duties were not much more than a revenue tariff. The Morrill and supplementary Acts raised them considerably during the war, and they were maintained at a high level after it, first to protect the Union's "infant industries" and afterwards as a part of U.S. policy of detachment. The Civil War also led to the laying down of many miles of rlys. for the transport of troops, munitions, and food, and these, when peace came, were rapidly pushed westward. The native Red Indians, like the herds of bison that had roamed for centuries over the great plains, were pushed westward, too. The bison rapidly became extinct. The Indians were concentrated into reservations allotted to them by the govt. The land thus cleared was devoted to cattle-raising, an industry given great impetus by the introduction in 1869 of refrigeration.

The cattle-ranchers moved farther westward and were followed by agricultural settlers. The Homestead Act, 1862, offered 160 acres of land free to any citizen or prospective citizen who would settle on it and work it for 5 yrs. During 1860-80 more than 65 million acres were taken up by native born citizens and immigrants from Europe, mostly Irish, German, or Swedish. The discovery of gold and silver in the far west encouraged emigration westward; the discovery of coal and iron close together in Ala., and of oil in Tex. and Okla., led to the development of industry in the agricultural S.

As the free land filled, immigrants from Europe began to settle in increasing numbers in the industrial towns of the E., where their presence created problems in administration and assimilation undreamt of when newcomers speaking no English were scattered workers on the soil. Rapid industrial development, and absence of all traditional ideas and restrictions, led to the concentration of immense power in the hands of "big business." Trusts were formed; their menace to the small business and the ordinary man was early recognized by congress which attempted in the Interstate Commerce Act, 1887, and the Sherman Anti-Trust Act, 1890, to put a brake on them. (*See Trusts*.)

For a hundred years after the declaration of independence the U.S.A. looked inwards to her own development, a preoccupation undisturbed by molestation from out-

side. But towards the end of the century she was forced to look over the wall. In 1898 feeling against Spain's tyrannous treatment of the people of Cuba came to a head with the blowing up of the U.S.S. Maine in Havana harbour, which the American public was convinced was a hostile act and not an accident as the Spanish govt. alleged. War was declared against Spain. It lasted only four months. The Americans were completely victorious, and annexed Puerto Rico, Guam, and the Philippines. Their experience in this war, however, convinced them of the value of rapid sea communication between their E. and W. coasts, and led the U.S.A. to complete the Panama Canal (*q.v.*). She also acquired Alaska from Russia by purchase in 1867; a share in the Samoan Is. (with Great Britain and Germany), 1889; and in 1898 annexed the Hawaiian Is.

Anglo-American relations were badly strained on more than one occasion during the second half of the 19th century. In 1861, two southern envoys had been arrested by Federal agents while on board the British ship *Trent*. In response to British protests, the Federal govt. apologised, and released the southerners. In 1862, the *Alabama* and other southern cruisers, built in England, had been allowed by the carelessness of the British govt. (which adopted an attitude of neutrality during the Civil War) to put to sea, where they almost destroyed the Federal merchant navy; the resulting dispute was settled by arbitration in 1871. A third cause of friction arose when in 1895 the U.S.A. endeavoured to persuade Great Britain to agree to the settlement by arbitration of her dispute with Venezuela over the boundary between that country and British Guiana. After an exchange of sharp notes between Washington and London, Great Britain in the end agreed to arbitration—and secured most of the territory that had been in dispute. Great Britain's attitude during the Spanish-American war resulted in a great improvement in Anglo-American relations. In 1909, a long standing dispute between Great Britain and the United States over the Newfoundland fisheries was referred to the Permanent Court of Arbitration at The Hague, and decided in 1910 in a way that satisfied both.

The outbreak of war in Europe in 1914 found the U.S.A. both totally unprepared for warlike activities on a large scale, and

determined to take no part in the conflict. She immediately proclaimed her neutrality, and maintained it for nearly three years, despite the disorganization of her trade caused by the effective Allied blockade of Europe, neutral and belligerent alike. She disliked the capture by the British navy of American vessels taking goods to European ports; but she also disliked the acts of destruction committed in her factories and elsewhere by German agents trying to interfere with the flow of American munitions to the Allies.

Declaration of War, 1917

The sinking in May, 1915, of the *Lusitania*, with the loss of 128 American lives, roused intense anti-German feeling in the country; but President Wilson was still able to maintain his policy that a nation may be "too proud to fight." The German submarine campaign against mercantile vessels grew intenser and more ruthless, however, and this, coupled with the interception of a German dispatch promising Mexico territories incorporated in the U.S.A. since 1848 if she would join in the war, led the U.S.A. to join the Allies, and to declare war on April 6, 1917. The part played by U.S. forces in the First Great War is described under that head.

* Irene Clephane

Fighting in the First Great War came to an end on Nov. 11, 1918. During the ensuing winter President Woodrow Wilson was the first man in the world. His decision to attend the peace conference was by no means popular in his own country, but it was hailed with enthusiasm in Europe. From the crowds in London and Paris he received a welcome of honour and gratitude such as no public man before him could have known. He was the elected head of a great republic whose might had made certain the Allied triumph. He seemed to embody the hopes of all the peoples.

Wilson's power, however, was severely limited. The Democratic party of which he was the head had just lost an election. He had little direct knowledge of Europe's deep-seated national problems. He was soon to find himself baffled in dealing with the statesmen of the old world, especially Clemenceau and Lloyd George. Being devoted above all to a single great purpose, the establishment of an inclusive League of Nations, he made one demand which proved to be a grave strategic mistake. This was that the covenant of the League

should be linked with the peace. When the Versailles treaty was signed, in June, 1919, the president was conscious of profound disappointment, and he foresaw that the League and the terms of peace would provoke a bitter party contest at home. His end was tragic. He undertook a western tour in defence of the Versailles settlement, and in Sept., 1919, suffered a paralytic stroke which left him helpless. On March 4, 1921, he ceased to be president. He died on Feb. 3, 1924.

In the election of 1920 the Democratic party and Wilson's policy were alike foredoomed. The new president was Warren G. Harding, senator from Ohio, an amiable mid-westerner who had been chosen by the bosses on account of a deadlock between rival candidates. His great majority revealed a fierce revulsion from Wilsonian ideas, and it swept the isolationists into power. The necessary two-thirds majority in favour of the treaty could not be mustered in the Senate. Wilson had refused to admit reservations to the covenant, and as a consequence the U.S.A. stood outside the League.

In the sphere of international politics Harding's short term was notable for one event only—the Washington conference of 1921–22 on the limitation of naval armaments. It resulted in an agreement which fixed at 5–5–3 the ratio of warships between the U.K., the U.S.A., and Japan. This meant parity for the two great powers. Harding died Aug. 2, 1923. He was succeeded by the vice-president, Calvin Coolidge, who occupied the White House until March, 1929. Coolidge was a Massachusetts politician—dour and reserved, offering in his manner a complete contrast to the open-handed friendliness which the world had come to look upon as typically American.

During the Coolidge term of 5½ years his country was as far as possible detached from world affairs. Between Great Britain and the U.S.A. there was one vexatious question—war debts and reparations—upon which opinion in the two countries was sharply at variance. The British view, roughly stated, was that the two problems were intermingled and that the American account could not be separated from the other inter-allied debts. The American public was slow in understanding that huge debts between govts. could not be discharged when imports were barred by high tariff walls. In 1923 Stanley Baldwin, going to Washington on behalf of

the Bonar Law cabinet, negotiated a settlement which was subjected to serious criticism. It could be maintained only until 1931.

The U.S.A. during the 1920s was deeply concerned over the problem of immigration. A law for drastic curtailment was passed in 1924. The republic's wide-open door was thus partially closed. Henceforward immigrants were admitted on a strict quota system, so designed as to give preference to the northern European peoples. There was no change of policy as regards the League of Nations; but Coolidge and his secretary of state sought an alternative through formal outlawry of war. In 1928 the Briand-Kellogg pact was signed in Paris. Fifteen govts. agreed to renounce war as an instrument of policy. No method of enforcement was considered. No sanctions or penalties were attached to violation of the pledge.

Herbert Hoover, the next president, had been secretary of commerce in the Harding and Coolidge cabinets. With that exception his career had lain wholly outside politics. A mining prospector by profession, with experience in Europe and the Far East, he became world famous as an organizer of war and post-war relief, a sphere of public service unknown before 1914. It became important by reason of the generosity of the American people, and Hoover, as head of the American relief administration, had command of immense funds. It is reasonable to assume that he would have been successful as a business president; but three-fourths of his four-year term were darkened by an unparalleled economic blizzard.

"Prosperity" Coolidge

Coolidge was the "prosperity president." When he entered the White House the U.S.A. was moving into a period of industrial expansion and commercial prosperity such as no country had ever before experienced. American productive capacity was an impressive phenomenon; prices were high, money was plentiful, a building boom made work without end, and the urban population enjoyed a standard of living never before attained. Similar conditions, it is true, did not prevail in the farming regions. On the contrary, before the end of the 1920s there were ominous warnings of increasing agrarian distress. But the tone was set by the cities, and that tone was an unbounded optimism until after Coolidge had passed into retirement. The signals of an impending break were ignored

by the politicians, and in 1928 Hoover ran on the slogan, "Four more years of prosperity." There was a widespread belief, encouraged by national leaders and even by many economists, that the U.S.A. with its enviable resources and unique command of industrial technique, had conquered poverty.

A terrific awakening was in store. The special feature of the Coolidge epoch was a wild expansion of credit and speculation, together with lavish foreign loans, which went mainly into the reconstruction of Germany and the financing of reparations. The Dawes plan of 1924 was designed to safeguard German finance and the reparations account; but it did not avail to check the cataract of American credit. Speculation raged without restraint. The banks went into speculative business in all directions. Stock-exchange prices were announced over the air. Stocks rose to fantastic heights. The fever attacked nearly all classes of society. Instalment buying was carried to the limit and beyond. There were no adequate warnings from the great financial houses, and in consequence when disaster befell, the country was totally unprepared. Faith in the magic of prosperity was almost unimpaired when, in Oct., 1929, the crash of the New York stock exchange heralded the worst and longest depression in history.

The Hoover govt. struggled in vain against the advancing desolation. The president himself was unrealistic. For more than a year he strove to persuade the nation that the depression would be short-lived, and he made the mistake of repeating that prosperity was just around the corner. This attitude he was forced to abandon in 1931, when his administration acknowledged the necessity of large federal grants in relief of the farmers and of the city and state govts. The closing stage of his term was unrelieved gloom. Unemployment rose until the total was estimated at not less than 15,000,000. Banks were closing by the thousand. Farmers everywhere were loaded with debt. The nation was desperately in need of a new impetus, an inspiring leader. That was F. D. Roosevelt's opportunity.

Elected in Nov., 1932, Roosevelt was inaugurated on March 4, 1933, when the U.S.A. was in the lowest depth of the depression. Every bank was closed. It was almost impossible for money to be transferred from city to city. The grim economic situation was

matched by an eclipse of the national spirit. For the first time in the history of the United States there were millions of men and women who found themselves driven to doubt the soundness of the national system and the American way of life.

History of Prohibition

Before continuing the general history of the U.S.A., it is necessary to consider that remarkable social experiment, national prohibition. For more than half a century the prohibition movement had been advancing by way of local option and state laws, until in 1918 the 18th amendment to the constitution made the sale of intoxicating liquor illegal throughout the republic. This step was backed by a formidable force of organized public opinion. The trade was discredited; the saloon was everywhere reprobated. Magistrates and medical authorities, educationists and social workers were united against it. The great employers were for any policy that encouraged abstinence among the workers. The Protestant churches were solidly identified with the crusade. Drys were victorious in so many of the states that by the end of the First Great War prohibition had come to seem inevitable. But no sooner was the amendment ratified than the difficulty of enforcement began to be realized, and in a few years its sheer impossibility was shockingly evident. The federal govt. and the states were faced with the challenge of lawlessness and violence on a stupendous scale, and with a dilemma which was not to be evaded. Prohibition could not be made effective. The costly and elaborate organization built up to enforce it provoked a defiance of the law such as no modern country had ever known. An enormous percentage of the people, including millions commonly thought of as law-abiding, fell into the practice of home distilling and dealt habitually with the bootlegger; drinking among young people increased to an alarming extent. The illicit trade in liquor became a gangster industry of enormous range and unmitigated evil. Successive Republican presidents had declined to denounce the 18th amendment. Roosevelt declared for repeal, and a newly elected congress followed him without delay. The 21st amendment, 1933, reversed the 18th, and national prohibition ended after 14 stormy years.

Roosevelt seized the reins of government with extraordinary

vigour. He was well prepared for his high office. Having foreseen the electoral victory, he had gathered together in advance a group of able advisers who worked out a broad plan of economic recovery. His first task was to restore public confidence in the banks, and the early success of his action in that field gained for him a fund of good will which was of the greatest help when he turned to the programme of the policy that was known as the New Deal.

F. D. Roosevelt and Congress

Roosevelt's authority over both houses of congress was, to begin with, absolute. On account of the deplorable conditions prevailing, party conflict had perforce to be suspended. His first year was marked by a speed and range of legislation, passed virtually by consent, never exceeded in any democratic country. This activity in Washington evoked a great popular response. Signs of recovery were soon in evidence, and the hopes of the nation revived. But the road ahead was not by any means clear. The first two acts of congress upon which Roosevelt relied, in launching the New Deal for industry and agriculture, were judged by the supreme court to be unconstitutional. The govt. had therefore to proceed by way of amended laws. The new agricultural policy was highly controversial, for it involved the severe restriction of crops and even the destruction of livestock. Subsidies and stable prices, however, brought results, although at a tremendous cost. The vigour and daring of the new administration were exhibited most impressively in the expansion of hydro-electric power under federal govt. control (*see e.g.* Grand Coulee Dam; Tennessee Valley Authority). The social reforms of the New Deal were long overdue, and as the country returned to prosperity they were accepted by all parties. This was especially true in regard to the Social Security Act, which covered unemployment and sickness insurance. An important Labour Act established minimum standards and the right of collective bargaining. For the first time in the U.S.A. the principle of full national responsibility for unemployment and destitution was acknowledged. This involved elaborate schemes of relief and public works over the whole country. The Roosevelt govt. adopted, almost without reserve, the theory that the only way out of a great depression was by spending for recovery. Hence the heads

of the new depts.—men whose integrity was never impugned—were given command of public funds on a scale never before known.

Before the end of his first term the privileged classes had turned against Roosevelt and the business world was denouncing him as the enemy. No vital American president can hope to escape obloquy, and Roosevelt became the object of class enmity to an unprecedented degree. His opponents were outspoken and without mercy, and they continued so to the end. But the millions remained steadfast in support: for them the president embodied the true American spirit and was their powerful friend in whom they did well to trust. This became manifest in the second election (1936) when Roosevelt had an unequalled triumph, winning 46 of the 48 states.

The menace of Nazi Germany was realized by him at an early date. He was quick also to see the danger to world peace in Mussolini's East African empire, in the Spanish civil war, and the Japanese invasion of China. The American people, however, absorbed in their own affairs, were overwhelmingly isolationist. There was a deep and general conviction that the U.S.A. must not again be drawn into the conflicts of the Old World. The settled policy was non-intervention. Neutrality Acts of 1935 and 1937 forbade the export of arms, and even of other goods, to any belligerent. In Oct., 1937, twelve months before the Munich compromise, Roosevelt ventured to deliver a challenging speech in which he urged positive cooperation by the great powers for the "quarantining" of any aggressor. The public response was hostile in the extreme. No move of any kind from Washington was possible. When war broke out in 1939 a third Neutrality Act, passed in Nov., permitted belligerents to buy war materials on a cash-and-carry basis, i.e. goods must be paid for in dollars and carried in the buyers' ships; it was passed only after prolonged debate. Not until the defeat of France, in June, 1940, did a general awakening begin.

The president then found himself able to call for immediate aid to the Allies. All available arms were poured into the U.K., and 50 old destroyers were turned over to the R.N. in return for a 99-year lease as bases of eight British sites on the Atlantic. By standing for election in 1940 Roosevelt broke the tradition against a third presidential term. His personal

prestige was immense, and he found it possible to make a ringing declaration that America must become the arsenal of democracy. The Allies, he said, were in desperate need of guns and tanks, of planes and ships. These they were to get from America in abundant measure, with munitions of all kinds. In Jan., 1941, he sent to congress the remarkable plan that was made effective in the Lend-Lease Act, a project of mutual aid in war wholly original in conception and magnificent in range and generosity. The best immediate defence of the United States, said the president, was "the success of Britain in defending itself," and the essential purpose of Lend-Lease was "the elimination of the dollar sign." No nation, he added, could have peace with the Nazis except at the price of total surrender and that was unthinkable.

"All Aid Short of War"

Lend-Lease was launched at the close of the bleak winter (1940-41) when Hitler had conquered half Europe. American war production had already begun to rise. Under the impetus of the new economic alliance it exhibited an immense power and rapidity of expansion, although there were elements of isolationism among some of the most powerful industrialists. The U.S.A. was still officially neutral. No leader, however powerful, would dare to propose any change. In the 1940 election Roosevelt had been impelled, like his Republican opponent Wendell Willkie, to give a positive pledge against the sending of American troops into a foreign war. The watchword by this time had become, "All aid to the Allies short of war," and the sentiment behind it was not weakened by the German invasion of Russia. On the contrary, that great gamble of Hitler's was seen as lightening the pressure upon the Western Allies, for the American people in general did not welcome the prospect of a war alliance with the Soviet Union. The president himself was still clinging to the hope that aid short of war, if given without limit, would be sufficient, thus leaving the U.S.A. in a position to use the weight of its whole influence in a world settlement. Nevertheless, the decisions and actions of 1941 carried the U.S.A. far beyond the bounds of any definable form of neutrality. The navies were cooperating in the Atlantic. American warships were ordered to shoot at submarines on sight. The U.S.A. established protective bases in Greenland and Iceland.

With the Japanese assault on Pearl Harbour, Dec. 7, 1941, the U.S.A. was immediately at war with both Japan and Germany. All doubts and hesitations had been blown away; Roosevelt was now head of a united nation. But the major part of America's fleet in the Pacific Ocean had been destroyed. War mobilisation took on a terrific momentum. The stupendous American industrial machine was geared to the full demands of total war. Existing plants were adapted and enlarged. New manufacturing centres sprang up in a few months or weeks. Small towns and rural areas were speedily transformed. Aeroplane plants and training fields were multiplied. New shipyards were built, with Henry Kaiser and other industrialists applying mass-production to seagoing vessels as well as to road and air transport. Perhaps the most striking aspect of this amazing development was the easy turning over of domestic manufacture to war purposes. The U.S.A. had long led the world in labour-saving devices and every sort of gadget for home and office and personal use. In the course of a few months the civilian market was deprived of refrigerators and washing machines, telephones and radio sets, typewriters and fountain pens. The new army and air forces were trained and equipped with unexampled rapidity. It was not long before American soldiers and airmen were appearing in all the theatres of war. Before the end came in 1945 the uniformed forces of the U.S.A. reached a total of more than 11,000,000.

Inter-Allied Conferences

Roosevelt's record as president and c.-in.-c. made him a unique world figure. His control of the fighting services and direction of the American war machine were maintained with unflagging energy. It was impossible for any of his associates to think of him as a cripple. Roosevelt and Churchill met for the first time at sea in Aug., 1941, when the Atlantic Charter was agreed upon. Later they conferred in Washington and at Quebec. In 1943, when the tide of war had turned, they agreed at Casablanca upon unconditional surrender as the only possible end to the fighting. In the same year came Roosevelt's first conference with Stalin, at Teheran, and in Feb., 1945, the conference at Yalta in the Crimea, his last attendance at a meeting of the "big three." The end of the war in Europe was then known to be

imminent, but the hand of death was upon the American president. He died suddenly at Warm Springs, Georgia, on April 12, one month before the German surrender.

After F. D. Roosevelt

The twelve years of Franklin Roosevelt's presidency were a momentous epoch of American history, a great transition in the life of the republic and in the status of the U.S.A. as a world power. By the 1930s the technological revolution in the U.S.A. was far advanced. The vast processes of war production caused a heightening of tempo and compressed within the shortest time great changes, economic and social, which under peace conditions would have needed many years. The consolidated might of North America had become the most impressive phenomenon of the world, and the victory over Japan made the U.S.A. supreme in the Pacific. The American republic and Soviet Russia now confronted one another, seemingly sharing between them the destinies of mankind. Nor could there be a more profoundly significant fact than this, that one of the greatest of American presidents had passed away almost at the moment when, by the release of atomic energy, the mind of man had brought within its control the fundamental energy of the universe.

Roosevelt's successor was Harry S. Truman of Missouri who, elected vice-president in 1944, had almost the whole of the fourth Democratic term to serve out. He was a stranger to the American people, known in Washington as a regular member of the party and a modest supporter of the Roosevelt policies. The cabinet was changed almost entirely, and the new president made one interesting experiment by appointing to the dept. of state the chief of staff, Gen. George Marshall. The measures incidental to an immense changeover from war to peace conditions were rapidly carried through, while the evidences appeared to show that the country generally was undergoing a revulsion from Roosevelt and his social aims. In the congressional elections of 1946 the Republican party, after 14 years in opposition, made substantial gains. It was therefore taken for granted that the long reign of the Democrats was over.

In 1948 the Democrats could not avoid the nomination of Truman as presidential candidate. The Republican choice was Governor Dewey of New York, who had been defeated by Roosevelt in 1944.

The Dewey organization was the most thorough application of streamlined methods to a political campaign that had so far been achieved, and the entry of a third party under Henry Wallace, Roosevelt's vice-president 1941-44, who claimed to have inherited the mantle of the New Deal, was believed to ensure a large reduction of the Democratic poll. A Republican victory was on all sides assumed to be inevitable. Truman's election, therefore, was an immense surprise, the greatest in the annals of the American parties. It was due mainly to three factors: the president's own energy, personal appeal, and fighting spirit; the support of organized labour, resentful of the Taft-Hartley Act, which had reduced the privileges of the labour unions; and a widespread fear among the wage-earners that a Republican congress and administration would endanger the gains of the Roosevelt New Deal. For later history see N.V.

S. K. Ratcliffe

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LITERATURE. Although any complete estimate of literature in the U.S.A. means a record of three centuries, even today there can be detected in it the characteristics of a young people. Despite roots in the old world, drawing on a common inheritance from the great masters, Americans write as men of a new civilization which they must make themselves for their own needs. Obviously such influences impart a stern tone of resolute democracy, mainly directed towards the common welfare, and, in its beginnings, not much interested in art or style. Governor Berkeley of Virginia (d. 1677) actually thanked God there were neither free schools nor printing, and hoped there might be none "these hundred years."

Books were written, however, before the close of the 16th century, of which the *Journal of William Bradford* and *Edward Winslow* was probably the first, closely followed by Governor John Winthrop's classic but tedious *History of New England*, and the Rev. Nathaniel Ward's theological outpourings.

Printing began with the crude Bay Psalm Book (1640) and the once-popular poem, *The Day of Doom*, by Michael Wigglesworth, who would admit "reprobate infants" to "the easiest room in Hell." With the three generations of Mathers—Richard, Increase, and the famous Cotton—the stern sway of extreme Puritanism lost its hold upon the thought and literature of New England. Cotton, curiously enough, was more extravagant than his father or even his grandfather, combining sacerdotal pedantry with ecstatic pietism. Of his 400 publications, the chief were *Bonefacius*, or *Essays to do Good*, which taught Franklin "charity by system"; the standard *Church History of New England—Magnalia Christi Americana*—and the beautiful elegy on his persecuted father, entitled *Parentator* (1724).

Writers on Religion

The 18th century opened with social and political developments which, for a time, crowded out the activities of literature, while New England itself lost the lead in population as well as thought. However, to this period belongs the great Jonathan Edwards, whose *Treatise on Original Sin* has been esteemed the most strictly logical exposition extant of extreme Calvinism, while his *Freedom of the Will* has been described as "the sole fundamental contri-

bution, outside the sphere of politics, which America has made to the world's thought."

His contemporary, Benjamin Franklin, a man of extraordinary versatility, provides a startling contrast. If Edwards retained the "God-intoxication or inward sweet delight in God" of earlier divines, the great father of American journalism was a complete materialist. He started the first American magazine—*The General Magazine and Historical Chronicle* for all the British Plantations in America—in 1741; and issued his *Poor Richard's Almanac* for 25 years. Caring nothing for art, and little for his own soul or humanity's, his immortal *Autobiography* is yet one of the world's classics. Revealing himself, he told the secret of a mighty race.

Then, too, appeared that "lively book about people who were very much alive," the *History and Present State of Virginia* (1705), by Robert Beverley; the sprightly works of Colonel Byrd (first published in 1841); and the scholarly *Chronological History of New England*, by Thomas Prince (1687–1758).

Though John Woolman (1720–72), the Quaker, was at different times a farmer, a clerk, and a tailor, he devoted himself to home missions and anti-slavery, and his "other-worldly" *Journal* has made its way into many an English home.

Among literary men who sowed the seeds of Independence were the shrewd John Dickinson, so well versed in English law; and Thomas Paine, who went to America in 1774. His masterly *Common Sense* was a trumpet call to all patriots, and *The Crisis* (1776–82) provided a constant challenge to free thought.

There was subtler genius and a more attractive personality in Thomas Jefferson, idealist, who drafted the Declaration of Independence; and if George Washington is scarcely regarded as a literary man, his *Letters* are intimate self-revelations, and the *Farewell Address* has sonorous dignity.

Young America, it would seem, was too much intent upon state-building for the gentler arts; and if the facile Philip Freneau and the Hudibrastic John Trumbull stand out among the verse writers, neither can claim to be called a poet. The nature-reading of J. Hector St. John de Crèvecoeur's idyllic *Letters of an American Farmer* (1782) has, indeed, more pretensions to real culture.

The first American play professionally performed in New York (1787) was *The Contrast*, by Royal Tyler, the well-read jurist; and the daring fiction, *Alcuyn*, of Charles Brockden Brown, America's first professional man of letters, came out ten years later. The preparatory eras of literature in America close with the well-known *Grammar of Lindley Murray*, and the immortal *Dictionary of Noah Webster*, who also wrote quaintly on every imaginable subject. Apart from his other works, over 70,000,000 copies of his manual on spelling have been sold.

Emergence of U.S. School

Of America's great names in literature from Washington Irving to Walt Whitman and Henry James enough has been said elsewhere. In their hands are seen the gradual emergence from old-world models to a new and strong independent English-spoken art. The poets and novelists, the humorists and historians, are as familiar as the favourite English authors of the same period, and Emerson has never lost his hold on English thought.

There was, perhaps, a more clearly American note in the lesser men, though William Bryant is usually called the "Wordsworth of America," and is second only to Longfellow in popularity as a poet. Certainly the Marjorie Dawe and the witty verses of Thomas Bailey Aldrich are unmistakably "new English"; Sidney Lanier, a second Edgar Allan Poe, is no less obviously a Southerner of the South.

No less un-English (to English perceptions) are Emerson's somewhat precocious disciple, Margaret Fuller; the American Burke, Daniel Webster; George Ticknor, historian of Spanish literature; the great *History of the United States* in 6 vols. (1882–84) by George Bancroft; and the distinguished *Personal Memoirs of Ulysses Grant*. Essayists like Channing, the Unitarian; Theodore Parker, transcendentalist; the moral Whipple; the flowery George Curtis; and even the learning of William Winter (1836–1917) have more of a "foreign" sound to English ears.

It is only, however, roughly speaking, in the 20th century that we come seriously to study American writers as apart from English, to watch for tendencies, and to discuss revolts in language and style. Every year bears witness to a vigorous originality.

an enthusiasm for real scholarship, and an alert, racy, shrewdness of outlook that have contributed much to the awakening of the old world.

In the first decades of the 20th century some of the best and most characteristic American writing seemed to be finding its natural outlet in the short story. The romantic impulses of Irving, Poe, and Hawthorne had yielded to a stronger and more numerous following of Bret Harte's brilliant manipulation of realistic drama set within vivid local colour. There was a spate of short stories for which the backgrounds were provided by every facet of the variegated American scene, from New England to California and Tennessee. The tendency was obviously stimulated by the partiality of Americans for their newspapers and magazines, which accustomed them to preferring their literature "made snappy," that is to say, concise, epigrammatic, laconic.

Humour and "Wisecracks"

The same stimulus ordered the exploitation of an even more characteristic American line, that unique gift of revealing the humour, and indeed the wit, of the exaggerated turn of phrase and the adoption of a reckless *enfant terrible* attitude towards the pomposities of literary tradition. These qualities had been seen in the shrewd nonsense of Artemus Ward and Mark Twain: in the same school were John Hay, with his Jim Bludso, and Joel Chandler Harris, with his Brer Rabbit. The kindly genius of O. Henry fanned it to a glowing blaze, and the same clever quaintness was later seen in the subtle short stories of Damon Runyon, and in the humours of James Thurber and Robert Benchley. More than a hint of its decadence is seen in the conscientious and elaborate "wisecracks" of American comedy scripts for film and radio, and in the grimaces of popular newspaper columnists. Nevertheless, it is sometimes said that American slang is the true poetry of a great nation, and the "wisecrack" no less than the epigram may have claims to be considered as a form of literary art.

A third characteristic, long persistent, has been the somewhat naïve sentimentalism cherished as the obverse side of the hardest-headed commercialism the world has ever known. Sentimentality in literature is by no means peculiar to America, of course, but

nowhere else did it have so long a run nor threaten to mar the work of so many good writers. If Louisa M. Alcott's *Little Women* has long been a nursery classic and Harriet Beecher Stowe's *Uncle Tom's Cabin* achieved immortality, the more mawkish qualities in such works reached their climax in Elizabeth Wetherell's *Queechy* and *The Wide, Wide World*, in the peculiar heart-throbs of Ella Wheeler Wilcox, and in the suave uplift of Ralph Waldo Trine. There is much to disarm the highbrow in the freshness of Kate Douglas Wiggin's *Rebecca of Sunnybrook Farm* or Alice Hegan Rice's *Mrs. Wiggs of the Cabbage Patch*. But fortunately the cinema industry came to the rescue in time, enabling those who favoured sentimentality to enjoy it henceforward in unprecedented measure without necessarily demanding it in their books, thereby enabling American literature to escape more swiftly than it might otherwise have done from a peculiar defect of its own early virtues.

The period between the two Great Wars saw American literature stepping at last into its own rights with the successful emergence of a new school of realists, led by Sinclair Lewis, first American winner of the Nobel prize for literature, and Theodore Dreiser, whose *American Tragedy* (1925) set the seal on the rebellious realism of several earlier works. Though Lewis owed much of his narrative style, and his manner of surveying the social scene, to such English masters of objective realism as Wells and Bennett, his subject-matter was essentially American, and it was he who first consciously set out, in *Main Street*, *Babbitt*, and other novels, to present America not only to itself but to the rest of the world as a phenomenon unlike any other.

But the leading influence in the development of the new school of writers in the 1920s was H. L. Mencken, who, as editor of *The American Mercury*, set new standards of literary and social criticism, leading a revolt against both the academic and the "moronic" in literature. Himself the author of a scholarly work on *The American Language*, he was called with some justice "the most powerful personal influence on a whole generation of educated people." Certainly he created a wider audience for such realistic writers as Lewis, Dreiser, Willa Cather, James Branch Cabell, Sherwood Ander-

son, Ernest Hemingway, and the poets Robert Frost and Carl Sandburg (who also wrote a long biographical study of Lincoln). Mencken's influence waned only after its work was accomplished, and a younger school of realists, harsh and iconoclastic but strong and courageous, had found not only a ready audience but new themes in the tragedy of economic depression in the 1930s. They included John Steinbeck, John Dos Passos, Erskine Caldwell (*Tobacco Road*), William Saroyan, and William M'Phree. Meanwhile Upton Sinclair had for over two decades pursued his own *genre* of crusading realism. John P. Marquand developed the ironic undertones of realism in such studies of the Boston scene as *The Late George Apley*. Archibald MacLeish, Edna St. Vincent Millay, and Jesse Stuart were the poets of the later realism; Eugene O'Neill (another Nobel prize winner), Maxwell Anderson, and Robert E. Sherwood were its principal dramatists. All were intent upon exhaustive dissection of the contemporary American scene.

Reaction against realism was simultaneously represented by such writers as Thornton Wilder, author of *The Bridge of San Luis Rey* and the thoughtful plays, *Our Town* and *The Skin of Our Teeth*, all expressing a preoccupation with art form, and Pearl S. Buck, author of *The Good Earth*. Another reaction against what was slick, terse, and sometimes crude was seen in the vogue for the almost audaciously long historical novel. Works of fiction like Hervey Allen's *Anthony Adverse* and Margaret Mitchell's *Gone With the Wind*, painstakingly accurate in historical detail, leisurely in character drawing, sprawling in texture, and perhaps "escapist" in intention, appeared to indicate yet another direction in which American writers were prepared to excel.

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United States Army Air Force. Former air organization of the U.S. army. Established in 1912 as a branch of military engineers, it became a separate corps in 1918. In the Second Great War, the U.S.A.A.F. had a maximum strength of 80,083 aircraft, and personnel numbered 2,400,000. It was divided into eight major commands: strategic, tactical, air defence, proving ground, air material, air transport, training commands, and air university; the last a research and advanced training organization. The strategic com-

mand was subdivided into operational forces, of which the 8th U.S.A.A.F. was stationed in Great Britain during 1942-45, and carried out the bulk of the daylight raids on Germany.

Altogether the U.S.A.A.F. flew 2,354,124 sorties: 1,692,468 in Europe and Africa, and 661,656 in Asia and the Pacific. A Superfortress bomber of the 20th U.S.A.A.F. dropped on Hiroshima the first atomic bomb used in warfare. During 1942-45 about 22,500 aircraft were lost in operations against Germany and Japan, while some 40,000 enemy aircraft were destroyed in action.

Under the National Security Act of July 26, 1947, the U.S.A.A.F. was separated from the army and, as the United States Air Force, became an autonomous service.

Units. Quantities in terms of which measurements are expressed. For scientific purposes the centimetre-gram-second (c.g.s.) system was built up during the 19th century, based on the three fundamental units of length, mass, and time. The first two are arbitrary and maintained by direct comparison with physical standards kept at Paris. The third is defined as 1/86,164-100 of a sidereal day. Other units, such as dyne, erg, etc., (*q.v.*), are built up by combinations of these.

For electrical and magnetic quantities a fourth fundamental unit is required, and two separate systems have been devised: the electrostatic system, based on the electrostatic unit (e.s.u.) of permittivity (*q.v.*); and the electromagnetic system, based on the electro-magnetic unit (e.m.u.) of permeability (*q.v.*). These are related by a factor equal to the speed of light (in cm per sec), *i.e.* very nearly 3×10^{10} .

In practice a number of the c.g.s. units prove to be inconveniently small; a few inconveniently large. A system of practical units has therefore been adopted, based on the metre and kilogram instead of the centimetre and gram, and hence called the m.k.s. system. *See* table.

For the measurement of some physical quantities, convenience or historical accident has led to the introduction of other units, not strictly fundamental, into the system; *e.g.* the degree of temperature (Fahrenheit or centigrade), the calorie, and the angular measures (radian, degree, revolution). For special units of length used for very small or very large distances, *see* Ångström Unit; Micron; Astronomical Unit; Parsec.

For engineering in English-speaking countries a series of units evolved in the early 19th century is retained. It is based on the foot, the pound weight (a unit of force), and the second, and includes the foot-pound (a unit of work), the horse-power (equal to 550 ft-lb per sec), the slug (equal to $\frac{1}{g}$ lb or 32.1725 lb as a unit of mass), and the poundal (the force which will give 1 lb mass an acceleration of 1 ft per sec²). The corresponding unit of heat is the British Thermal Unit (B.Th.U.), the amount of heat required to raise 1 lb water through 1° F.; 1 therm = 100,000 B.Th.U. Electric power is sold by the Board of Trade Unit (B.T.U.) or kelvin, a unit of energy equal to one kilowatt-hour or 3,600,000 joule.

Finally, there are various systems of units which cannot be directly related to the fundamental units, usually because they are based on the physiological peculiarities of the human senses: *e.g.* the candle, lumen, lux, phot, etc. used for measuring light (*see* Illumination), and the bel (*q.v.*) and phon used for measuring sound. *See also* Weights and Measures; Metric System; and articles on the individual units.

Universal (Lat. *universalis*, belonging to the whole). In logic, a general term or concept, opposed to the particular, variously interpreted at different times. Like the Platonic ideas, universals were regarded as archetypal forms, which were in existence before things (*ante res*); like the Aristotelian entelechies (actualities), as inherent in things

things (*post res*). The universals are five: genus, species, difference, property, accident. Disputes as to the nature of the universals led to the struggle between nominalist and realist. *See* Logic; Syllogism.

Universalists. Name given to those who believe that all men, however wicked, will ultimately be saved. This view was held, with some limitations, by the followers of Origen (*q.v.*). The first sect to make it a distinctive feature was founded in London in the 18th century by a Unitarian named James Rely. The present centre is in Cavendish Road, Clapham.

The American Universalists (500 churches) were founded at Gloucester, Mass., 1779, by John Murray, who had been associated with Rely in London, and held their first convention at Boston in 1785. The sect has become subdivided at various times, notably by the secession of the Restorationists in 1840. These maintained that the wicked would pass through temporary punishment after death.

Universal Language. Means of communicating ideas to all the inhabitants of the civilized world by universally understood sounds or written signs. *See* Basic English; Esperanto; Ido; Volapuk.

Universal Shell. Properly a shell case, a field gun projectile of the First Great War, which could be filled with either shrapnel or H.E., so simplifying battery equipment.

Universe. The whole of creation regarded collectively. Philosophically, it may be defined as everything that exists or appears to exist, known and unknown, material and non-material. To man the meaning, and indeed the nature, of the universe remains a mystery, and, as many think, an insoluble mystery.

So far as the stellar universe is concerned, modern astronomical observations indicate that space is not filled uniformly with matter, but that certain types of condensation occur. The fundamental unit of the cosmos seems to be the star, of which the sun is a typical example. Whether planetary systems such as that circling the sun are normal features of a star's constitution is not yet known, but they are in any case quite insignificant on the cosmic scale. Apart from such minor condensations as double and multiple stars and star clusters, the next unit is the galaxy, of which our own Milky Way system is probably typical. The average galaxy contains several thousand million stars, which cluster thickly near its centre, and vast

Quantity	m.k.s.	c.g.s.
Force	newton	10 ⁵ dyne
Energy	joule	10 ⁷ erg
Power	watt	10 ⁷ erg per sec
		e.s.u. e.m.u.
Charge	coulomb	3×10^9
Current	ampere	3×10^9
Resistance	ohm	$\frac{1}{9} \times 10^{-11}$
Potential (e.m.f.)	volt	$\frac{1}{3} \times 10^8$
Capacity	farad	9×10^{11}
Inductance	henry	$\frac{1}{9} \times 10^{-11}$
Magnetic flux	weber	$\frac{1}{3} \times 10^8$

amounts of uncondensed interstellar matter. Most galaxies are in rotation and are thereby flattened. It is this flattening in our own system, observed from within, which produces the observed appearance of the Milky Way. Galaxies tend to occur in groups or clusters, but they do not appear to thin out towards the extreme limit of penetration of our biggest telescopes. The more distant ones, however, seem to be travelling away from us and from each other, and this has given rise to the theory that the universe is steadily expanding. See Nebula; Relativity; Stars.

University (Lat. *universitas*). National institution for advanced teaching and study, recognized for that purpose by a charter from the state. A university is empowered by its charter to confer degrees upon its students, after they have conformed to the regulations laid down in the statutes. These regulations determine the conditions of length of residence, attendance on lectures, and the requisite examinations to be passed before degrees are conferred.

Most universities are teaching universities, i.e. they contain a staff of teachers, styled professors, lecturers, or readers, appointed each for a special subject, to give instruction, and to direct the studies of students. Such students as are admitted to the university must have passed an entrance examination, and are then said to be matriculated. From the time of matriculation to that of taking the degree, the student is called an undergraduate; after conferment of the degree, a graduate. Degrees are usually of bachelor, master, and doctor. They can be taken in various groups of subjects, known as faculties. Examinations normally complete the courses of study followed under the instruction and direction of professors.

Historically it is to be noted that the original term for a university was *studium generale*, a place in which were established facilities for teaching and learning, open to all comers, and not restricted to a special community of a town, or of a monastery. To the medieval universities of Italy, and to that of Paris, students went from various European countries, and found it convenient to group themselves into nations, according to the country or province from which they came. Thus a *studium generale* contained many groups, not altogether without analogy to trade and craft guilds.

In the latter part of the 14th century *universitas* came to be used in the sense of a university. In other words, the first use of *universitas* was for voluntary groups, and it developed gradually into the idea of the whole institution, as recognized by the emperor or the pope, when its position was guaranteed by an imperial charter or papal bull. This seal of authority not only gave unity to the community of teachers and scholars as a whole, but also became a symbol of the unity of the whole learned world, because universities thus chartered were alone enabled to confer on their graduates degrees (certifying studies and training in teaching) which carried with them the right of teaching not only in their own university or their own country, but also in any *studium generale*.

This right was particularly helpful to the spread of knowledge, because medieval teachers and scholars communicated everywhere, both orally and by writing, through the medium of the Latin language and not through the vernacular. They naturally valued highly the facility of moving about from university to university at home and abroad. Roughly speaking, this use of Latin, as the language of teaching and learning, broke up with the decline of the Renaissance. We may date the beginning of the downfall of Latin for England with the Restoration of 1660.

Not only has Latin fallen entirely out of use as a spoken language, but in some modern universities movements have arisen to minimise the study of ancient languages for degrees, if not to remove them as necessary subjects for all degrees. The modern civic universities are inclined to lay great stress on the subjects underlying the special industries of their localities. Hence, in some ways and to some extent there has been a reversal of the old idea that the university developed in the student a power of entering into the knowledge and learning common to all the universities.

On the other hand the modern university lays more and more stress on the "university spirit." This means a constant watchfulness to aid and promote the advancement of learning and discovery of knowledge, to provide the stimulus of intellectual inquiry in every subject, and to raise the tone and level in all professional training. Particularly it aims at encouraging in teachers and taught a right and effective attitude towards methods of research. The

most famous British and foreign universities have separate entries in this Encyclopedia. See also Gowns colour plate; Sorbonne. Consult Universities of Europe in the Middle Ages, Rashdall, 1895.

University College. The oldest college of Oxford university.

Doubtful tradition ascribes its



University College
arms

origin to Alfred the Great. In 1872 the millennium of its establishment was celebrated, and there is reason to believe that a society of some kind was in existence before 1249, when William of Durham left money for the purpose of founding a college. The buildings, which front the High Street, date partly from the 17th century, including the chapel, hall, and old library, and partly from the 19th. The most famous name in the college records, although he was "sent down" after only a year's residence there, is Shelley, to whom there is a striking monument by Onslow Ford. Lord Herbert of Chesham, Dr. John Radcliffe, Sir Edwin Arnold, Viscount Cecil of Chelwood, and Clement Attlee were "Univ" men, and among fellows were Lords Stowell and Eldon. Sir Michael Sadler was master 1923-34, and Sir William (later Lord) Beveridge, 1937-45.

The universities of London and Durham have each a University College, both the oldest in those universities. In London, University College, the buildings of which are in Gower Street, was opened as the university of London in 1828. In 1836 a change was made, the university becoming a distinct institution, but a connexion, which still exists, was kept between the two. The college head is the provost, and it has its own staff of professors. University College, Durham, dates from 1837, and there are University colleges at Exeter, Hull, Leicester, Nottingham, and Southampton.

University College Hospital.

London hospital. Situated in Gower Street, London, it was founded in 1833, and rebuilt and enlarged, 1897-1905, by the munificence of Sir J. Blundell Maple. Addition of the Hospital for Tropical Diseases and St. Pancras Hospital in 1948 brought the number of beds to approx. 1,100. Here Liston on Dec. 21, 1846, performed the first operation under anaesthetic in Great Britain, using ether for

the purpose. An excellent medical school is attached to the hospital.

University Settlement. Place of residence for university men in the poorer parts of a great town. These settlements were started with a view to the cooperation of young university men in the work of ameliorating the lot of the poor by personal service in social and educational directions. Toynbee Hall (*q.v.*) was the pioneer institution of the movement. There are over 400 settlements in the U.S.A. alone. See Settlement, Social.

Unknown Warrior. Name given to the remains of one man, chosen as a representative of those who fell in the First Great War. The idea originated in Great Britain, and took the form of selecting from a war cemetery in France the body of a soldier, whose identity was unknown, to be buried in Westminster Abbey as a symbol of the nation's homage to the fallen. The body was exhumed in 1920 and brought to London, where on Armistice Day, Nov. 11, in the presence of the king, and with heads of the services acting as pall bearers, it was interred in the abbey in soil brought from France.

Canada also interred an unknown warrior, and in 1921 the body of an unknown American soldier was removed from France and buried in the national cemetery at Arlington, Washington, on Nov. 11. France's unknown warrior is buried under the Arc de Triomphe in Paris, where a flame burns perpetually in his honour; Italy's in the church of Santa Maria degli Angeli, Rome; and Portugal's in Batalha Abbey.

After the Second Great War, America arranged for similar honour to be paid to the body of an American soldier of that war. It was to be chosen from one of 5,600 such bodies conveyed from France to America in 1947.

Unleavened Bread. Flat cakes or biscuits (Heb. *mazzoth*), made without yeast, and eaten ritually by the Jews. According to the Mosaic law (Ex. 12), the feast of unleavened bread, during which all leaven is removed from the house, is celebrated for seven days after the Passover, at which feast also unleavened bread is eaten. In the R.C. and Monophysite churches unleavened bread is used in the Eucharist. See Leaven; Passover.

Unna or UNA. River of Yugoslavia. It rises in the Dinaric Alps, flows N.W., N., and N.E., in part forming the boundary between

Bosnia and Croatia, and joins the Save some distance below Sissek after a course of 140 m.

U.N.R.R.A. Word formed from the initials of United Nations Relief and Rehabilitation Administration, an organization proposed by the U.S.A. and set up Nov. 9, 1943, in Washington by representatives of 44 nations. Its object was to give immediate aid after liberation to those in need (estimated at 70 millions) in those parts of Europe which the Germans had occupied and exploited. At its first session the organization recommended that each member govt. whose home territory had not been occupied should contribute 1 p.c. of the national income for the year ending June 30, 1943, and that other member govts. should contribute if able to do so. Herbert H. Lehman (*q.v.*) was director general from Nov., 1943, to March, 1946, when he was succeeded by Fiorello LaGuardia until Dec. 31, the official end of U.N.R.R.A. Maj.-Gen. Lowell Rooks of the U.S. army took charge of the winding up of the organization, completed June 30, 1947; its functions in respect of food aid passed to the Food and Agricultural Organization (*q.v.*), of resettlement to a new U.N. international refugee organization. Other functions were taken over by the world health organization and the international children's fund.

During its existence the organization gave the total quantities shown in the table of food, clothing, medical supplies, and materials for rehabilitation. The U.K. contributed £155 million; Australia £12 million; N.Z. £2.6 million; S. Africa £275,000; Canada 77 million dollars; the U.S.A. 2,500,000,000 dollars. Of the 7-8 million Displaced Persons (*q.v.*) in Germany and German occupied territories, U.N.R.R.A. assisted in repatriating some 7 million.

U.N.R.R.A. Aid in Tons

Italy	9,928,700
Greece	2,667,500
Yugoslavia .. .	2,424,700
China	1,986,700
Poland	1,954,400
Czecho-Slovakia..	1,551,800
Austria	1,009,300
Ukraine	439,600
Albania	183,600
White Russia ..	148,200
Philippines .. .	44,900
Dodecanese .. .	34,300
Hungary	19,900
Korea	11,100
Ethiopia	9,800
Finland	8,500
San Marino .. .	200

U.N.R.R.A. aid undoubtedly saved many thousands from death by starvation, particularly in Greece and Yugoslavia. Consult International Economic Organization, H.M.S.O., 1947.

Unsaturated Compounds. Term used in chemistry for carbon compounds in which the carbon atoms are united by two or three bonds. They are able to combine directly with hydrogen to form saturated compounds, *i.e.*, the carbon atoms are joined by single valencies. There is a series of unsaturated acids known as the oleic series. See Oleic Acid.

Unst. Most northerly of the Shetland Islands and therefore of the British Isles. Unst is 28 m. N. by E. of Lerwick. It lies almost N. and S., being 12 m. long and averaging 4 m. in breadth. Balta Sound and Uyea Sound furnish anchorage for vessels of medium draught. Fishing and knitting are the principal occupations. The island is wildly picturesque and is visited by plovers and rare moths. See Shetland Isles.

Unter den Linden (Ger., under the limes). Thoroughfare of Berlin, Germany. Running from the Brandenburg Gate to the monument of Frederick II, it is 198 ft. wide and about two-thirds of a mile long. It was bordered by a double avenue of trees, mostly limes with a few chestnuts, but these fell victims to Hitler's planning, and the street was finally wrecked by Allied bombing during the Second Great War. See Berlin illus. p. 1105.

Unterwalden. Canton of Switzerland. It lies S. of the lake of Lucerne, and comprises the two half-cantons Nidwalden (106 sq. m.) and Obwalden (190 sq. m.). Nid, or lower, Walden adjoins Lake Lucerne; Ob, or upper, Walden is higher. The canton is drained by the two rivers Aa and contains lakes Sarnen and Lungern. Horticulture and cattle rearing are the chief industries, and fruit and dairy products the main exports. The two half cantons have separate administrations, Sarnen (Ob) and Stans (Nid) being the two capitals. The people are German-speaking Roman Catholics. One of the four forest cantons, Unterwalden joined the confederation of 1291. Pop., Obwalden, 20,340; Nidwalden, 17,348.

Unto This Last. Four essays on the first principles of political economy by Ruskin. They were published as a volume in 1862 after having appeared in The Cornhill Magazine. The work is an attack on the idea that wealth is an end

Untouchable. Term applied to certain castes according to Hindu religion. The subject is dealt with under Depressed Classes.

Unwin, MARY (1724-96). Close friend of the poet Cowper. Born at Ely, she became in 1744 the wife of Morley Unwin (1703-67), and was friendly with Cowper from 1765. With him she moved two years later to Olney, and there and at Weston acted as his devoted attendant until her death on Dec. 17, 1796. She inspired the famous lines *To Mary*, and other verses.

Unwin, SIR STANLEY (b. 1884). British publisher. Born Dec. 19, 1884, he was educated at Abbotsholme and Haubinda.



Sir Stanley Unwin,
British publisher

Entering publishing, he became chairman and governing director of George Allen and Unwin, and a director of various other publishing firms. He was a prominent member of the publishers' association of Great Britain, of which he was president 1933-35, and was president of the international publishers' congress 1936-38 and from 1946. He helped to prevent the application of purchase tax to books in the U.K. and was a frequent contributor to the press on the baneful effect on the book trade of the shortage of paper during and after the Second Great War. He several times revised and reissued his best-known book, *The Truth about Publishing*, which first appeared in 1929. He was knighted 1946.

Unwritten Law. Popular term for an assumed right to execute summary vengeance on behalf of a female relative, by killing her violator or seducer. Although occasionally allowed by American courts, the principle has never been recognized in law.

Unyoro or **BUNYORO**. Native kingdom of Uganda. It is bounded by Lake Albert, the Victoria Nile, and the Kafu and Nkusi rivers. E. of the scarp overlooking the lake is a plateau with conical hills rising about 1,000 ft. above the plateau level of about 3,500 ft. Palajoki, 4,876 ft., in the S.W. is the highest point. The N.W. corner is an animal reserve in which hunting is prohibited. Hoima was the headquarters, 1900-12, and was succeeded by Masindi, whence motor roads go to Butiaba and

Port Masindi. N.E. of the capital lie grass-covered rolling plains. The kingdom was annexed in 1896.

Upas Tree (*Antiaris toxicaria*). Tree of the family Moraceae, a native of Java. When the bark of



Upas Tree. Leaves and fruits of the Javan tree, the sap of which is used for poisoning arrows

the tree is incised, a milky juice exudes that is extremely virulent and is used for poisoning arrows. Its principle is known as antiarin, and is allied to strychnine. On the basis of this single fact a mass of legend was built up, as, for example, the story that nothing could live within a considerable radius—10 or 12 m.—of it, so virulent was its effluvia. Gladstone referred to the Irish problem as his upas tree.

Upavon. Village of Wiltshire, England. It stands on Salisbury Plain, near the Avon, 8 m. S.E. of Devizes, and was once a market town. Near here is a R.A.F. research and training establishment.

Upholders or **UPHOLSTERS**. London city livery company. Granted arms in 1465 and admitted later to the Skinners' fraternity, it was given a charter in 1626. Upholders seem at first to have been engaged in the peltry trade, then to have been fripperers or dealers in second-hand clothes, furniture warehousemen, furniture dealers, pawnbrokers, and undertakers. The office is at 61, Victoria Street, S.W.1.



Upholders'
Company arms

Upholland. Urban district of Lancs, England. It is 4 m. W. of Wigan, and has a little coal mining and quarrying, but brickmaking is more important. A Benedictine priory was founded here in 1319 by Robert de Holland, whose family takes its name from this place. There is a grammar school. Pop. est. 6,250.

Uppington. Town of the Cape Province, S. Africa. It is situated on the Orange river, 2,600 ft. above sea level and 258 m. by rly. N.W. of De Aar. It is the centre of an agricultural district and of tungsten mining. Uppington became important during the First Great War. It was held by the rebels during the S. African rebellion, and later in 1914 was connected by rly. with Prieska. The line was then carried across the Orange to the German frontier at Kalkfontein to facilitate the conquest of German S.W. Africa. Pop. approx. 11,000.

Upminster. Parish of Essex, England. Part of the urban dist. of Hornchurch, it has become a suburb 15 m. E. by N. of London, being the terminus of underground rly. and bus routes. Part of the church dates from the 13th century, interesting brasses are shown, and there are two avenues of yews. Great Tomkyns is a 15th century house, and the golf club uses a gabled hall of Elizabeth's reign. Pop. 3,732.

Upper Nile Province. Province of the Anglo-Egyptian Sudan. It contains the dists. of Abwong, Malakal, Renk, Zeraf Nuer, Lau Nuer, and Sobat Nuer, and comprises a wide area between the Bahr-el-Jebel (Mountain Nile) and Abyssinia in the S., and a narrow strip on both sides of the White Nile in the N. between the provs. of Blue Nile and Kordofan. The administrative centre, formerly Kodok, was later changed to Malakal. Area, 92,270 sq. m. Pop. 711,500.

Upper Senegal-Niger. Name until 1920 of a colony of French W. Africa now known in English as French Sudan. See Sudan.

Upper Volta. Territory of French W. Africa. Formed from part of Upper Senegal-Niger in 1919, it was partly transferred to the Niger colony in 1926, abolished 1933, and reconstituted 1947. It is subject to the gov.-gen. of French W. Africa but locally administered from Ouagadougou, the capital. With the Black Volta river as S.W. boundary, it lies between the river Niger and the N. boundaries of Ashanti, Togoland, and Dahomé. See West Africa, French.

Uppingham. Market town of Rutland, England. It is 98 m. N.N.W. of London, and 7 m. S. of Oakham, being served by rly. Apart from the school (*v.i.*), the chief building is the church of SS. Peter and Paul. There is a trade in agricultural produce. Pop. 1,703.

Uppingham School. English public school. It was founded in 1584 by Robert Johnson, and was

for nearly 300 years a country grammar school. In 1853 Edward Thring was appointed headmaster, and under him it became a great public school. New buildings were erected, and it has now museum, laboratories, swimming bath, etc. The chapel dates from 1891. Divided into upper, middle, and lower divisions, Uppingham has accommodation for 450 boys.

Uppsala. Co. or län of Sweden. It lies W. of the co. of Stockholm, between Lake Mälär and the Baltic Sea. About half the area of 2,056 sq. m. is forested. In the N. are the celebrated iron mines of Dannemora. Pop. est. 148,277.

Uppsala. City of Sweden, capital of the co. of the same name. It is situated in a fertile plain on both sides of the navigable river Fyrisä near Lake Mälär, 41 m. by rly. W.N.W. of Stockholm. The ancient and historic city on the right bank of the river is chiefly renowned



Uppsala arms

for its university, which was founded in 1477, and, after a chequered career, was munificently endowed by Gustavus Adolphus; the Gustavianum is its oldest building. A handsome Renaissance building was added in 1886-87, and the university has also an observatory. The botanic garden has palm houses and an orangery. The orangery of an older garden houses a collection of northern antiquities. The university library, which received the collections of Gustavus Adolphus, contains the Codex Argenteus of Ulphilas. Near the city is an academy of agriculture.

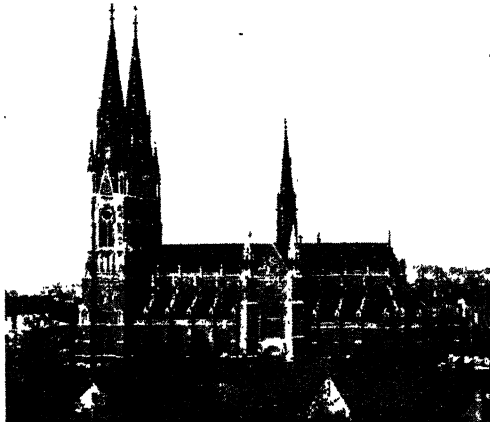
Uppsala cathedral dates from 1230, and within it is the gorgeous burial chapel of Gustavus Vasa, who built the half finished castle, the Slott, on a hill S. of the city, which now contains the provincial archives. Linnaeus, who resided in

the city, is commemorated in the cathedral. Uppsala is the metropolitan see of the Lutheran or state church of Sweden. Pop. 48,725.

Upset Price.

In sales by auction, lowest price at which a vendor is willing to sell his property. It thus forms a start for any bidding that may take place, and it was long customary to name the upset price in advertisements of the sale. See Auctioneering.

Upton. Town of Worcestershire, England. It stands on the Severn, 8 m. due S. of Worcester, and has picturesque Tudor architecture. A 14th century tower is all that remains of a church ruined in the Civil War; the building



Uppsala, Sweden. The 13th-century Gothic cathedral, in which Linnaeus is commemorated

which replaced it in the 18th century has a spire rising 183 ft. Upton has associations with John Dee, the astrologer, Mrs. Siddons, and Fielding's Tom Jones, who came to the White Lion inn. It is connected by rly. with Tewkesbury. Pop. 1,968.

UR: A SUMERIAN CITY REVEALED

Sir Leonard Woolley, Director of Excavations at Ur

A perusal of other articles in this work, e.g. Archaeology; Assyria; Babylonia, is suggested. See also Abraham; Chaldaea; Persia; Tigris, etc.

The ruins of Ur, called by the Arabs al Mugheir, or the mound of pitch, were identified as the site of Ur by the results of excavations conducted for the British Museum by Taylor in 1855. Further excavations were undertaken by the British Museum in 1918, and by the joint expedition of the British Museum and of the museum of the university of Pennsylvania from 1922 onwards.

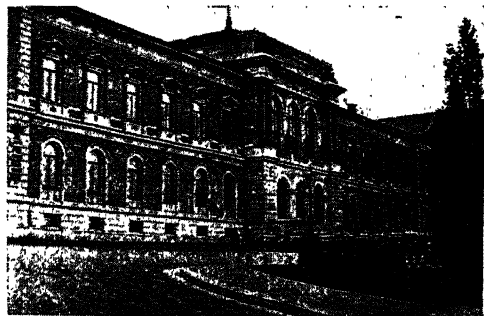
The earliest remains, consisting chiefly of painted pottery and stone implements, represent the first occupants of the lower valley of the Euphrates, probably not Sumerian but Semitic-speaking

Akkadians from the North. The Sumerian civilization first comes to light with the royal and other graves dating to about 3,500 B.C., but by that time it was fully developed and must have had behind it many centuries of growth. There has been found a great wealth of vessels and orna-

ments, weapons and tools, in gold, silver, copper, and in a variety of stones, and much inlay in shell and lapis lazuli, all bearing witness to an art of a high order, and to a technical skill in dealing with metal and other materials which is unsurpassed in later periods of Mesopotamian history. The large use of precious metal shows that the civilisation was a prosperous one.

Since the raw materials are all imported, trade must have been extensive and important; this, and the conquests of the Sumerian army (whose formation and armament is illustrated on a remarkable mosaic standard found in one of the graves), spread the influence of Sumerian civilization over a very wide area. The kings of the Sumerian city states seem to have been deified in their lifetime at this period as well as later, and their deaths were celebrated by human sacrifice on a large scale, but apart from this little is known of the religion of the time.

In 3,500 B.C. Ur was probably a vassal of the king of the city of Erech; about 3,100 B.C. Mes-annipadda, king of Ur, made himself master of all Sumer and its dependencies and founded the first dynasty of Ur. At al 'Ubaid, four



Uppsala, Sweden. The main building of the university, erected 1886-87

miles from the capital, there has been discovered a temple of the goddess Nin-khursag built by his son A-anni-padda, which was adorned with reliefs in copper and mosaic, with statues of lions in copper, and with wooden columns overlaid with copper, or with incrustation in red and black stone and mother-of-pearl.

The first dynasty lasted for five generations and then Ur was conquered by rival states and for a long time remained a subordinate city. Remains of this period are scanty, but they suffice to show that the religious importance of the place as the centre for the worship of the moon-god Nannar was maintained, and at least one of its overlords, the great Sargon of Akkad, installed his daughter as high priestess of the god at Ur.

The Third Dynasty of Ur

For a brief while the hegemony of Sumer was regained by the second dynasty of Ur, but of this nothing is known, and the city comes again into prominence only with Ur-Nammu (Ur-Engur), who being governor of Ur revolted against his master, Utu-khegal, and founded the third dynasty. There ensued the time of the greatest prosperity of Ur. Ur-Nammu and his son Dungi virtually rebuilt their capital on a very magnificent scale, reorganized and enlarged the irrigation system, encouraged trade and, by their military conquests, extended their dominions to the Persian uplands on the east, and to the shores of the Mediterranean on the west.

Many of the best preserved monuments of Ur date either from this period or from that immediately following it, when, after the destruction of the city by the Elamites, the suzerains of Isin and Larsa were careful to restore the buildings of the third dynasty kings on their original lines. The Ziggurat, or staged tower, a sister structure to the Tower of Babel at Babylon, today one of the most striking ruins in Iraq, is the work of Ur-Nammu. Four other temples, a royal palace, and the walls of the inner city also represent the labours of his house and give a very fair idea of the appearance of the religious centre of the city in the great age.

Most of these buildings, either in their original form, or as restored by the Larsa kings, were standing when Abraham lived at Ur between 2,000 and 1,900 B.C. A number of private houses have been excavated and illustrate the domestic conditions of the Abrahamic times. The

houses, brick-built, were two storeys high and might contain on an average twelve or fourteen rooms forming a square round a paved court open to the sky. In type almost identical with the better-class houses of modern Baghdad, they were eminently comfortable and bear witness to a high standard of living among the urban population. Curious features are the presence, in some of the houses, of small chapels for domestic worship and the custom of burying the members of the family under the floor either of the chapel or of some other room. Since by 3,500 B.C. the main principles of architecture were already understood by the Sumerian builder and even in the tombs the vault, the arch, and perhaps the dome were used, the designers of the third dynasty temples had full technical knowledge and their work must have presented an appearance surprisingly modern. The art of sculpture, too, was far advanced, and from the fragments that survive today it is clear that the statues of the gods are worthy of the splendid buildings which housed them.

About 1,900 B.C. Hammurabi of Babylon conquered Ur; some thirty years later an ill-judged revolt brought the armies of Babylon again on the scene and the old city was laid waste. Though destined never again to be a capital of empire, Ur long retained its importance as a religious centre, and subsequent kings of Babylon repaired from time to time the damage done by the soldiery and the gradual decay of the brick buildings. In the fourteenth century B.C. king Kuri-Galzu undertook a thorough restoration of the city's monuments, and again in the 11th century B.C. we find evidence of much building activity.

Religious Significance

Even under the Assyrians the claims of the ancient Sumerian capital could not be disregarded, and the local governor, Sinbalatsukibi, was commissioned to repair or rebuild a number of temples. It is probable that the motive of the kings was usually a political one, an attempt to conciliate southern feeling by attention to the southern gods. About 600 B.C. Nebuchadnezzar was particularly energetic in the work of restoration, and most of the temple ruins contain, in the upper parts of their walls, bricks stamped with his name. There can be little doubt that in this he was making a bid

for support in his struggle with neighbouring Assyria.

His grandson Nabonidus also did much work at Ur and amongst other things restored the Ziggurat, completing in blue glazed bricks the shrine which crowned its summit, and he consecrated as high priestess of Nannar his daughter, Belshalti-Nannar, the sister of Belshazzar. But the defeat of the latter in the field by Cyrus the Great and the overthrow of the Babylonian empire involved the downfall of Ur. The Persian conqueror satisfied his hatred of Nabonidus by the destruction of the buildings erected by him, and though he did repair certain temples the city could not recover.

Its political importance had long since gone. It is probable that the Euphrates had already shifted its course and by putting out of commission the canal system ruined Ur's agricultural prosperity. Soon the adoption by the Persians of the Zoroastrian creed made the religious associations which had preserved it hitherto a cause of offence. The old temples were dismantled and burnt, the population drifted elsewhere and their houses sank into decay. By 300 B.C. Ur was a heap of ruins.

Uraba. Gulf of the Caribbean Sea. On the coast of Colombia, it forms the S. portion of the Gulf of Darien, and receives the Atrato. It penetrates inland some 50 m.

Uraemia. Form of toxæmia, or blood poisoning. Due to the retention of urea in the body, it may develop in the course of nephritis or Bright's disease. Early symptoms are foul breath, coated tongue, headache, palpitation, and sometimes cramp. Treatment consists in active purgation and promoting sweating.

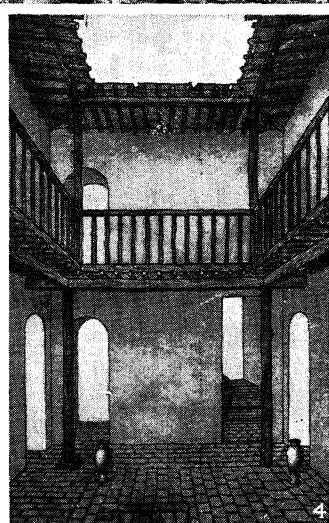
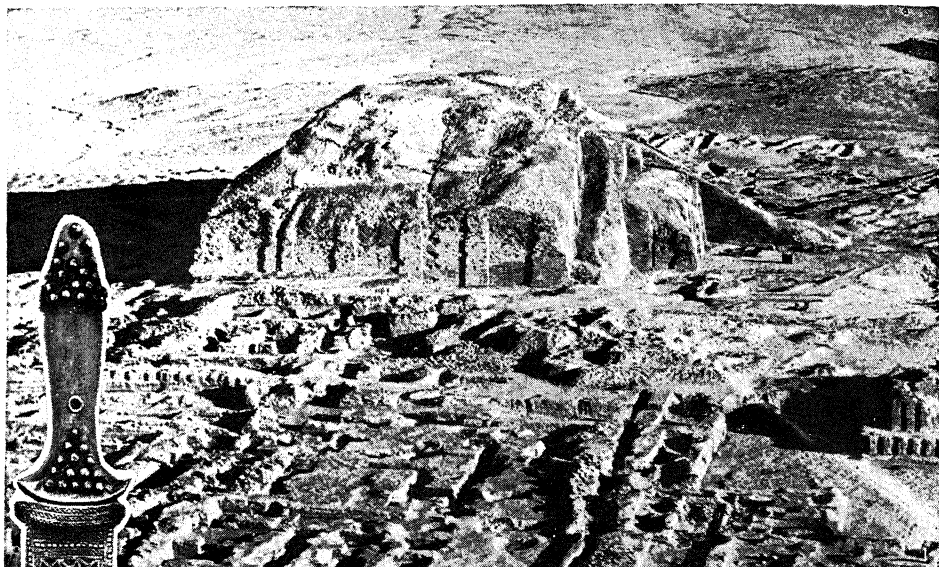
Uraeus. Ancient Egyptian serpent-symbol. Representing the African hooded cobra, Naja haje, it surmounted the forehead of royal persons. This emblem migrated to Phœnicia and Mexico, and survives in the sub-continent of India. See Serpent Worship.

Ural. River of S.E. Russia. Rising on the E. slope of the Ural Mts., R.S.F.S.R., it flows generally S. to Orsk, then W., and from Uralsk runs S. through Kazakh S.S.R. to discharge itself by three arms into the Caspian Sea at Guriev. It is c. 1,500 m. long, and for the most part too shallow to be navigable. During part of its course E. of Chkalov, it forms the boundary between Europe and Asia. The lower course is noteworthy for fishing.



Gold forms the head-dress; gold, lapis lazuli, and carnelian the necklaces, earrings, and other adornments

UR: GOLDEN CROWN AND JEWELRY OF A SUMERIAN QUEEN OF 3000 B.C.



1. Ur and the temple Ziggurat seen from the air. 2. Dagger in gold and lapis lazuli about 3,500 B.C. 3. Reconstruction of a Sumerian queen's headdress, about 3,000 B.C. from a stone tomb at Ur. 4. Reconstruction of private house of the time of Abraham, about 2,150 B.C. 5. Head of lion in copper and inlaid bitumen, about 3,100 B.C. 6. Relief of god Imigig in copper, reconstructed from fragments found at Tell el-Obeid.

UR: DISCOVERIES IN A SUMERIAN CITY THAT FLOURISHED 5,000 YEARS AGO

Courtesy of Joint Expedition to Ur

Ural (Russ. *Zemnoi Poias*, girdle of the world). Mountain range in Russia. It extends some 1,600 m. from the Arctic Ocean to the Caspian Sea, and is usually regarded as the boundary between Europe and Asia. The range is the W. edge of a broad belt of folding, most of which is buried under Tertiary deposits in W. Siberia. The Urals are usually divided into three sections, N., middle, and S., the highest points being in the N., where two peaks, *Sablia* and *Tel-Pos*, both reach over 5,000 ft. In the S. the range becomes a plateau, under 1,500 ft. high. The mts. are a climatic barrier, annual rainfall on the E. side varying between 8 and 16 ins. and on the W. side exceeding 20 ins.

Mining of salt, iron, and copper began in the 16th century, and extensive gold deposits were found in 1745. Other minerals worked include manganese, platinum (of which the Urals before the First Great War furnished over 90 p.c. of the world's supply), uranium, tellurium, chromium, and silver. Under the Soviet regime the area was much developed, and during the Second Great War, after the loss of the Ukraine, it became the main seat of Russia's war industries. Its industrialisation, begun under the first five-year plan, was later accelerated, many new towns and new industries being planned and created. Heavy engineering, including making machinery, is of first importance, but there are also china, glass, cement, and brick works, while leather and textile factories are in operation.

Much of the lower slopes of the Urals is covered with deciduous forests, which provide timber for furniture-making and other industries. In the wilder parts animals such as fox, wolf, and ermine are hunted for their skins. On the steppes to the S.E. camels are bred. The *Sverdlovsk* region of the R.S.F.S.R. extends on both sides of the Urals, among the principal towns being *Sverdlovsk*, *Irbit*, *Pern*, and *Molotov*.

Ural-Altaic. Term denoting a family of agglutinating languages. It is an attempt to embody E. European with Asiatic elements. The simpler term *Altaic* is often preferred, comprising the W.-Altaic sub-families, *Samoyedic* and *Finno-Ugric*, including *Hungarian*; and the E.-Altaic sub-families, *Turkic*, *Mongolic*, and *Tungusic*. In these languages, unlike inflexional Indo-European, the root is unchangeable, suffixes being added, the vowels of which are assimilated

to the chief root-vowel by vocalic harmony. See *Altaic*; *Turanian*; *Ugrian*.

Uralite. In mineralogy, an amphibole resembling actinolite, formed by the secondary alteration of pyroxene. The original mineral often retains its form but is changed to an aggregate of slender amphibole fibres. Originally recorded in a rock from the *Ural Mts.*, uralitisation often occurs in altered pyroxene rocks.

Uralsk. Town of *Kazakh S.S.R.* Founded in 1775, it stands on the *Ural* river, 160 m. W.S.W. of *Chkalov*. It is the terminus of the *Ryazan-Uralsk* rly., and a centre for grain and cattle from the *Kirghiz* steppe. There are flour mills and leather works, as well as iron and woollen industries. Pop. 66,201.

Urania. One of the nine muses in Greek mythology. Daughter of *Uranus*, she presided over astronomy, and is usually represented as a draped figure bearing a globe in her right hand, a staff in her left.

Uraninite. Alternative name of the mineral pitchblende (*q.v.*).

Uranium. One of the chemical elements. Its symbol is *U*; atomic no., 92; atomic weight, 238.07; specific gravity, 18.69; m.p., 1689°C.

The element is named after the planet *Uranus* and was discovered by *Klaproth* in 1789. It occurs in pitchblende, which is essentially U_3O_8 but contains in addition thorium, the rare earths, lead, calcium, and bismuth. It is known to exist in *Cornwall*, the *Belgian Congo*, the *Ural mts.*, *S. Africa* (*Blyvooruitzicht*), *S. Australia* (*Flinders Range*), and *Canada* (the *Great Bear Lake*), the last being probably the richest source. The other principal ore of uranium is *carnotite* or *potassium uranyl vanadate*, $K_2(UO_2)(VO_4)_3 \cdot 3H_2O$, which is the main source of radium (*q.v.*) in the *United States*. Until recently the main interest in uranium ores lay in the radium in them and the extraction of this metal for medical purposes was the chief concern, the uranium being merely a by-product. With the advent of the modern technique of splitting uranium atoms as a source of atomic power its production has become of the greatest importance.

The principal steps in the extraction of the metal are to leach the roasted ore with sulphuric acid. Sodium nitrate is then added to oxidise the uranium, which passes into solution together with copper, iron, manganese, and calcium.

Sodium carbonate precipitates the first three of these, and the uranium is converted into soluble sodium uranyl carbonate. The uranium is finally obtained as sodium uranate (uranium yellow) which may vary in colour from yellow to orange. The metal itself is prepared by reduction of the oxide in a calcium chloride flux with calcium under argon in a bomb; or the fused double alkali fluoride may be electrolysed. Freshly prepared uranium resembles steel in appearance, but although the metal stains in air the corrosion does not penetrate. The metal combines readily with oxygen, nitrogen, and the halogens giving U_3O_8 , U_3N_4 , and UX_4 respectively.

Several oxides are known, each giving rise to a series of salts in which uranium may show valencies of 2, 3, 4, 5, and 6.

Industrial uses of uranium are limited, one of the most important being the addition of uranium yellow to ceramics. As little as 0.006 p.c. gives a good yellow colour, and the addition of further amounts will deepen the colour through olive green to black. All uranium compounds are radioactive, *i.e.* they spontaneously and continuously emit alpha and beta particles, being transformed in the process into other elements, finally ending with lead. The identification of the alpha and beta particles with a doubly charged helium atom and the electron respectively led to speculation whether alpha particles might not be used for bombarding other atoms (*see Atom*), and hence for effecting transformations.

Natural uranium consists of three isotopes of masses 234, 235, and 238 of which the first is present in only very small amounts and the latter two in the ratio of 1:140. The isotope of mass 235 was at first of importance from the point of view of atomic fission (*see Atomic Bomb*). Neutrons (*q.v.*) are used for this purpose. U^{238} does not undergo fission on bombardment with neutrons, but a neutron is absorbed, giving rise to a new element *neptunium* (*Np*) and by similar processes *plutonium* (*Pu*), *americium* (*Am*), and *curium* (*Cm*) are produced. These are known as *trans-uranic* elements and it is unlikely that useful quantities will be found in nature. *See Cyclotron*.

Uranus (Gr., heaven). In Greek mythology, the first king of the gods. He was the son of *Ge*, the Earth, and by her was the father of *Oceanus*, *Hyperion*, *Themis*,

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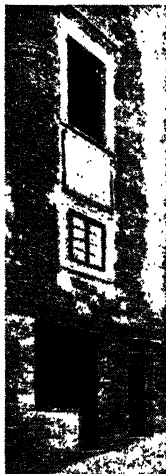
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Urganj or **URGENJ.** Town of Turkmen S.S.R. It is about 85 m. N.W. of Khiva, on an affluent of the Amu-Daria or Oxus, and is the commercial centre of a large district. Historically it is known

as a principal place in the Khiva Khanate, often itself called Urganj. Jenghiz Khan in 1220 was one of many tribal leaders to storm the place, which was strategically more valuable before the Amu-Daria changed course. As Orgunje it is mentioned in the famous descriptive passage which closes Arnold's *Sohrab and Rustum*.

Uri. Canton of Switzerland. It comprises 415 sq. m. in the valley of the Reuss, with outliers of the Bernese Alps on the W., the Glarus Alps on the E., and the St. Gotthard group to S. It is elevated, sparsely peopled, and almost solely dependent upon the pastoral industry and its dairy products. Altdorf, scene of Tell's exploits, is the capital, and Andermatt is in this canton. The inhabitants are German-speaking Roman Catholics. One of the four forest cantons, Uri joined the Swiss confederacy of 1291. Pop. 27,302.

Uriah. Hittite soldier, whose fate is told in 2 Sam. 11. David, having committed adultery with Bathsheba, wife of Uriah, ordered his captains to place the latter "in the forefront of the hottest battle," where he was slain by the people of Rabbah. This drew upon David the rebuke of Nathan, and his child by Bathsheba died at seven days old.

Urial (*Ovis vignei*). Species of wild sheep, found in the Punjab, Tibet, Afghanistan, and Baluchis-

monium salt, and in the blood and calculi of gouty patients as the acid sodium salt. It is the chief constituent of the excreta of birds and reptiles. Uric acid was discovered in 1776 by Scheele in urinary calculi. It may give rise to stone by reason of its insolubility.

Uriconian Series. In geology, a group of ancient Pre-Cambrian lavas, volcanic tuffs, and minor intrusions which form the Church Stretton hills and the Wrekin, Shropshire. They underlie the sediments of the Longmynd, and are tentatively correlated with similar rocks in the Malvern Hills and Pembrokeshire. They are named after the ancient Roman city of Uriconium (*v.i.*). See Pre-Cambrian; Tuff; Volcano; Wrekin.

Uriconium or **VIROCONIUM.** A Roman British town, tribal capital of the Cornovii, on the site of Wroxeter, Shropshire. It was probably established as a military fort by Claudius with the XIV legion about A.D. 47; when the legion withdrew in 70 a municipal centre quickly developed. Within its walled enclosure of 170 acres were a market place 394 ft. by 265 ft., public baths, and fine houses of Italian design. The junction of the Watling Street and of roads from Caerleon and Chester, Uriconium attained much opulence. Excavations in 1912-14 and 1923-27 revealed: rows of colonnaded

shops, a temple, furnaces for bronze working, etc. See Britain; Wroxeter.

Urim and Thummim. Sacred objects which the ancient Hebrews employed as oracles or media for learning the will of God. They were probably two small stones, representing "yes" and "no," one of which was shaken out of some receptacle. On difficult occasions, as in 1 Sam. 14, an agreement was previously made as to the meaning to be attached to the lots. In a late document, Ex. 28, v. 30,

they are referred to as carried in the high priest's breastplate. The whole question of Urim and Thummim is obscure, even the meaning of the words, which have been translated as Lights and Perfections, or as Light and Darkness, being uncertain. See Breastplate; Lot.

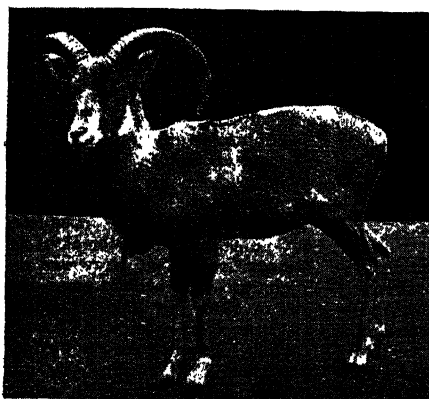
Urine. Fluid containing waste material abstracted from the blood.

Urine is secreted by the kidneys, from which it is passed through the ureters to the bladder, and thence is voided at intervals through the urethra. Normal urine is of a yellow colour, which may vary in tint to a considerable degree without indicating any deviation from health. The most important pigment is termed urochrome, and there are smaller quantities of other pigments. The reaction of normal urine is acid, this being due chiefly to the presence of acid sodium phosphate. Urine becomes less acid during the process of active digestion, and is also less so in vegetarians and herbivorous animals. The chemical constitution also undergoes various alterations during pregnancy.

An increase in the amount of urine passed occurs in diabetes, certain forms of nephritis or Bright's disease, and occasionally in hysterical attacks. It may also result from taking drugs which stimulate the flow of urine, such as caffeine and citrate of soda. Albumen is present in the urine in high fevers and in certain diseases of the kidney. Sugar in the urine is indicative of diabetes, but small amounts may be present in certain affections of the nervous system, in physical fatigue, and in other diseases. Bile may be present; obstruction of the bile ducts results in the bile passing into the blood stream. Blood in the urine occurs in black-water fever, in acute nephritis, and in injuries to the kidney and bladder. Pus there may be due to suppuration in any part of the urinary channel. Bacteria may be present in typhoid, gonorrhoea, tuberculosis, and other diseases, while occasionally eggs of Bilharzia, or indications of other parasites, are found. Deposition of urates and other salts while the urine is still in the kidney or bladder gives rise to the formation of calculi and gravel. Extravasation is leakage of the urine into the surrounding tissues owing to injury of some part of the walls of the channel. Suppression of the urine occurs when the kidneys have ceased to exercise their function, the commonest cause being acute nephritis.

Uri-Rothstock. Alpine peak of Switzerland, in the canton of Uri. It rises to 9,620 ft., S.W. of the S.E. end of Lake Lucerne. To the S.W. is the Engelberg Rothstock, 9,250 ft.

Urmia, URUMIA, OR URUMIYA. Lake of Persia, also called Daria Shah, or the royal lake. Lying at an alt. of 4,000 ft. in Azerbaijan



Urial. Big-horned, wild sheep of central Asia that dwells in flocks in the valleys and on the hills

tan. It stands about 3 ft. high, and has greyish brown hair on the upper parts, with whitish underparts. The horns measure about 27 ins. along the curve. Urials are found both in the valleys and on the hills, usually in flocks.

Uric Acid. Crystalline substance found normally in small quantities in urine as the acid am-

prov., it has no outlet and is very shallow. Owing to its saltiness, fish cannot live in it. The area is 1,795 sq. m., length about 80 m., and width varies up to 35 m. The most important town near the Lake is Tabriz, on the E.

Urmia, **URUMIA**, or **URUMYA**. Town of Persia. Situated 12 m. W. of the lake of the same name, in Azerbaijan prov., it is said to be the birthplace of Zoroaster (*q.v.*). It is now the seat of an R.C. bishop. Raisins are exported.

Urmston. Urban dist. of Lancs, England, comprising the townships of Urmston, Flixton, and Davyhulme. About 5 m. W.S.W. of Manchester, it is a residential suburb with a large industrial estate. There are three rly. stations. Pop. 37,500.



Urn depicted in bas-relief on a Greek stela of the 5th century, B.C.

Urn (Lat. *urna*). Vase of clay, glass, stone, or metal, especially one with an egg-shaped body on a pedestalled base. In ancient Rome urns were used for drawing lots, storing water, or depositing before tombs. Ruder sepulchral wares were placed in Neolithic, Bronze Age, and late-Celtic graves in Britain and elsewhere. The modern tea urn retains the

characteristic shape. See Canopic Jar; Cinerary Urn.

Urn-Burial. Interment of human remains in a jar-shaped receptacle, usually of clay. The urn may enclose the whole body, the severed parts, or the disjointed bones after the removal of the flesh; these being placed in the urn either immediately or after a preliminary earth-burial. The custom is traceable, for unburned and burned remains, in pre-Columbian and recent aboriginal America.

Urn-Burial is the short title of a book written by Sir Thomas Browne and published in 1658. Its full title is *Hydriotaphia, Urne-Buriall*; or a discourse of sepulchral urnes lately found in Norfolk. It is regarded as containing, especially in its final chapter, some of the most magnificent passages in English prose. See Browne, Sir T.

Urotropine or **HEXAMETHYLENETETRAMINE**. Drug prepared by the action of ammonia on formaldehyde and also known as hexamine (*q.v.*).

Urquhart or **URCHARD**, **SIR THOMAS** (c. 1611–c. 1660). Scottish author and translator. Eldest son of Thomas Urquhart of Cromarty, he was educated at King's College, Aberdeen. As an opponent of the Covenant, he took part in the abortive movement in the north in 1639, and then took



Sir Thomas Urquhart, Scottish author. From an old print

refuge at the English court, where he was knighted in 1641. In 1649 he joined the Royalists, and was taken prisoner and confined in the Tower, but was released through the clemency of Cromwell in 1652. In that year appeared *The Jewel*, a panegyric of the Scottish nation, and in 1653 *Logopandectes*, an outline of a universal language marked by great ingenuity.

Urquhart's reputation rests on his translation of Rabelais, one of the masterpieces of its kind. As one critic said, "In point of style Urquhart was Rabelais incarnate, and in his employment of the verbal resources, whether of science or pseudo-science and slang, he almost surpassed Rabelais himself." Little is known of Urquhart's later years. Tradition says that he died of an uncontrollable fit of laughter when he heard of the Restoration of Charles II.

Ursa Major or **THE GREAT BEAR**. One of the northern constellations. Its brightest stars form the Plough or Charles's Wain, a familiar constellation in the N. sky. It consists of seven bright stars denoted by the first seven letters of the Greek alphabet, and a number of fainter stars. α and β Ursae Majoris are called the pointers from the fact that the line joining them points approximately to the pole star. Six of the chief stars are of the second magnitude, and the seventh, ϵ Ursae Majoris, of the third. ζ Ursae Majoris, or Mizar, was the first telescopic double star to be detected. There are many other double stars in the constellation, and the well-known Owl planetary nebula.

Ursa Minor or **THE LESSER BEAR**. Constellation between Ursa Major and the north pole. The constellation was also known as the Twister, from its obvious constant

circling of the pole. α Ursae Minoris is Polaris, the pole star.

Ursula (5th century). Virgin martyr, the patron saint of maidens. She is said to have been the daughter of a Cornish prince and to have fled with her friends to Gaul to escape the Saxon invaders of Britain. After a visit to Rome she is reported to have been slain with many others by the Huns about 453, near the banks of the Rhine, and to have been buried at Cologne. She is commemorated with her fellow virgin martyrs on Oct. 21.

Ursulines. R.C. religious order for women. It was founded at Brescia by S. Angela di Merici (1470–1540).

The original institution was an association of young ladies living at home, devoting their spare time to works of piety and especially to the education of poor children. In 1535 the association received episcopal approval as a religious community; the spread of the work in the next few years led to the approval of Pope Paul III. Under the protection and guidance of S. Charles Borromeo it was made an enclosed religious order under the rule of S. Augustine by Gregory XIII in 1572. The order, which is famed for its schools, maintains several convents in Great Britain.

The Company of S. Ursula is another congregation founded at Dôle by Anne de Xaintonge in 1606. Occupied in conducting elementary and secondary schools and in pious works, it has houses in Europe and America.

Urticaceae. Botanical name for the nettle family. This is an extensive family of herbs and shrubby plants, natives of the temperate and warm regions. They have mostly alternate leaves, and the flowers have usually the sexes separate. The fruits are one-seeded. Familiar examples are wall-pellitory (*Parietaria*) and the stinging nettle (*Urtica*).

Urticaria. This complaint is described in the article Itch.



Ursulines. Habit of the Order

Uruguay. River of S. America. With the Paraná it forms the Plate river (*q.v.*). It rises in the coast range of S. Brazil and flows W.N.W. as the Pelotas, through a little known jungle forest. Most of its course of 1,000 m. is over the plateau. For the lowest 100 m. it is a broad stream, 6 to 9 m. across. Sea-going vessels reach Paysandú, 150 m. upstream; smaller vessels are stopped by rapids at Salto, 50 m. farther; above the rapids barges traverse the next 300 m. The chief affluent is the Rio Negro. For the lowest 400 m. the river separates Uruguay from Argentina.

Uruguay (Republica Oriental del Uruguay, republic east of the Uruguay). S. American republic



Uruguay arms

which takes its name from the river Uruguay. It is wholly within the S. temperate zone, on the Atlantic coast, S. of Brazil, separated from Argentina by the Uruguay on the W. and by the estuary of the Plate on the S.W. The old name of the country, dating from the time when Uruguay was part of the Spanish viceroyalty of Rio de la Plata (River Plate), and still in local use, is La Banda Oriental (the eastern bank), whence the inhabitants style themselves Orientals.

Uruguay, which has an area of 72,153 sq. m., is the smallest in size, and second smallest in pop. (2,202,936 in 1942), of the S. American republics. A third of the pop. lives in Montevideo (est. 770,000), the capital. The birth rate is 19.9 per thousand; the death rate 10.4.

Uruguay owes its independent existence to its geographical position. Historically it belongs to the Spanish system of River Plate provinces which formed the Argentine confederation. It is an extension of the treeless grassy plain of the Argentine pampa, though the Uruguayan open country is less flat and uniform. The grass lands sweep in long undulations or ridges. The *cuchillas* or tops of the ridges form as it were natural causeways. The gentle declivities between them slope down to winding *cañadas* or watery hollows which feed innumerable small streams mostly flowing into the affluents of the Uruguay. The streams and rivers are bordered by low trees; otherwise the grass lands are usually treeless except for occa-

sional plantations. Five considerable rivers, of which the Negro is the largest, flow W. into the Uruguay, three flow E. into the Lagoa Mirim, an extensive lagoon about 50 m. from the Atlantic coast. To the N. of the Rio Negro the hills are higher and steeper than S. of it.

Uruguay enjoys an excellent climate, in spite of summer heat and the rapid fall in temp., especially from Oct. to Jan. (summer), caused by the *pampero* or violent line squall from the S. or S.W. At Montevideo the mean temp. ranges, on the average, from 72° F. in Jan. to 51° F. in July; the highest temp. recorded is 102° F. and the lowest 32° F. Rain falls at all seasons, the nature of the distribution determining whether wheat or maize is grown. The country is well adapted for white labour, and there has been considerable immigration, particularly from Italy and Spain.

CONSTITUTION. A new constitution, approved by popular vote in 1942, confirmed the existing legislative and governing bodies of (a) president and vice-president and a cabinet of nine ministers, (b) senate of 30, presided over by the vice-president, who holds the casting vote, and (c) chamber of

There is universal suffrage, women being given the vote under the 1934 constitution. Elections for both houses are held every four years; voting is secret. The country is divided for local administration into 19 depts.

Uruguay enjoys complete liberty of religion, but the majority of the people are R.C. Elementary education is compulsory; elementary and secondary education are free. Montevideo is the seat of a university opened in 1849 and normally attended by some 19,000 students.

The people of Uruguay are predominantly of European origin, with some admixture of American Indian and negro blood. They are of a simpler and less cosmopolitan type than the Argentines, preserving in a greater degree the old-fashioned Creole ways. Montevideo, the capital, is also the chief port. Paysandú, Salto, and Fray Bentos lie on the navigable Uruguay. Spanish is the language of the country. There is a prolific and ably conducted newspaper press. Uruguay's best known writer was J. E. Rodó (*q.v.*).

Ocean steamers ascend the Uruguay as far as Paysandú; large river steamers can get as high as Salto. Above the cascades

which give this town its name, smaller craft ascend to the Brazilian frontier and beyond. The 1,477 m. of rly. were, except some 80 m. already under state control, British owned until bought by the Uruguay govt. in 1948; they are of standard gauge. Good motor roads connect the capital with most of the important cities; long distance bus services plying over 2,600 m. of highway. There are air services to all N. and S. American countries, Carrasco to the E. of Montevideo being the chief airport.

Most of the occupations of Uruguay are pastoral, principal products and exports being meat, wool, and hides; there are large establishments, notably at Fray Bentos, for making meat extract and canning meat; jerked beef is



Uruguay. Map of the pastoral republic of South America formerly known as La Banda Oriental, i.e., the eastern bank of the Uruguay

deputies of 99; but whereas, under the constitution of 1934, 15 of the senate seats and three cabinet posts were assigned to the party taking second place in a general election, seats in both senate and chamber were filled on a basis of P.R., and the president was left free to choose his cabinet.

still prepared by old-fashioned methods for export to Brazil and the W. Indies. Meat and wool account for 85 p.c. of the value of Uruguay's exports. There are, however, some important industries, among manufactures produced being boots and shoes of first-class quality, woollen and worsted fabrics, cotton goods, carded yarn, and rayon fabrics, jute bags, cordage, flour and biscuits, glass and bottles, cigars and cigarettes, wines, beer, and spirits, and motor car tires. This industrial development arose chiefly from the need to produce goods otherwise unobtainable during the two Great Wars by the cutting off of European manufactures.

A govt. organization enjoys a monopoly of the manufacture of chemicals which include alcohol, sulphate, chloride, carbonate of soda, chloroform, collodion preparations, sulphuric ether and acid, superphosphate, sulphate of iron, benzol, toluol, naphthalene, nitric acid, hydrochloric acid, caustic soda, and ammonia. Large quantities of soap are manufactured in Montevideo. Uruguayan marble is used extensively in Argentina and Great Britain.

Damming of the Rio Negro and the construction of a hydro-electric plant, in progress in 1948, promised a great increase in Uruguay's industrial potential.

HISTORY. Little is known of the history of the area which came to be called Uruguay before the arrival of Solis, first European navigator to reach the Plate estuary who landed on its N. shore 1512, but on a second visit was killed and eaten by the savage Charruas, the natives of the country. In the 17th century Spanish Jesuit missions endeavoured to Christianise the Indians. The first white settlement was made in 1678, when the Portuguese of Brazil founded the port and settlement of Colonia del Sacramento on the shore opposite to Buenos Aires, to be an outpost of Portuguese advance and a base for the smuggling trade with the Spanish provs. beyond the river.

This was the beginning of the rivalry between Portugal and Spain, later between Brazil and Argentina, for possession of the Banda Oriental, a conflict which is the principal cause of the turbulent history and late development of Uruguay. The governor of Buenos Aires asserted Spanish sovereignty over Colonia, and during the following 85 years it changed hands eight times. Finally

the place was taken and its fortifications destroyed by the Spaniards in 1777. After Buenos Aires became independent in 1810, Montevideo was still held by the Spaniards, but surrendered to Argentine forces in 1814.

But dissensions broke out between the Argentine commander and the local leader Artigas (*q.v.*), who proclaimed the independence of the Banda Oriental, Aug. 25, 1825. Brazilian occupation of Montevideo followed, there was a revolt headed by Lavalleja, the second hero of Uruguayan independence, and three years war, 1825-28, between Argentine and Brazil for the possession of the country. Through British mediation peace was made Aug. 27, 1828, on the basis of the independence of Uruguay, which became a buffer-state. Her independence was still not respected. Amidst the strife of local leaders, complicated by Brazilian intervention, Rosas (*q.v.*), the tyrant of Buenos Aires, tried to conquer the country; Montevideo received the help of Garibaldi in its eight years' siege. Only after the fall of Rosas in 1853 was Uruguay free to start national construction. She joined Argentina and Brazil in the war against Paraguay, 1865-70.

During the First Great War Uruguay broke off diplomatic relations with Germany; during the Second she declared war on Germany and Japan on Feb. 22, 1945. During both, she was an important supplier of food, particularly meat, to the Allies. She was a foundation member of the United Nations, being represented at the San Francisco conference in April, 1945. *Consult* Uruguay, W. H. Koebel, 1912; *The Argentine and Uruguay*, H. J. G. Ross, 1917; *Utopia in Uruguay*, S. G. Hanson, 1938; *Historia de la Republica O. del Uruguay*, 8 vols., J. Salgado 1943.

Urus. Name given by the Romans to the European wild ox, *Bos taurus primigenius*, also called by its German name Aurochs (*q.v.*).

U Saw (1900-48). Burmese politician. Acting as premier during 1940-41, he visited London on a mission to discuss with Winston Churchill the future status of his country. On leaving England he got into touch with the Japanese consul in Lisbon. The British govt., apprised of this, had his aircraft overtaken and forced down in Palestine, and U Saw was interned for the remainder of the war. Released

in 1946 he returned to Burma, and was one of a deputation under U Aung San conferring with the British govt. in London. Refusing to sign the agreement



U Saw,
Burmese politician

reached on Burma's political future, he resigned his seat in the cabinet. After the assassination of U Aung San and six ministers, July 19, 1947, U Saw was tried on charges of abetting the murders and conspiring to overthrow the govt. He was found guilty and executed May 8, 1948.

Usedom. Island in the Baltic Sea. It lies N. of the Stettiner Haff, between the Swine and Peene channels. Length 36 m., area 158 sq. m. The people engage in cattle rearing, farming, and fishing. Seabathing resorts dot the coast. Swinemünde and Usedom are the chief towns. In 1945 the island, long a German possession, came within the Russian zone of occupation, except for the extreme E. point, allotted to Poland.

Uses. English legal term. Uses means the use or enjoyment of a thing, apart from actual ownership, and a similar meaning attaches to the word use, the modern equivalent of which is trust. In feudal times land could not be bequeathed or transferred to a religious house, so to surmount the difficulty the lawyers invented the theory of uses. Land was transferred, as far as its legal ownership was concerned, but the original owner, or someone selected by him, enjoyed the profits therefrom. In 1536 the statute of uses was passed to prevent this practice, but it was a failure as other methods were invented by the lawyers. *See* Land Laws.

Ushabti. Funerary statuette in the form of a mummy, interred with the dead in ancient Egypt. The word is usually said to denote "answerers," who respond on behalf of the deceased to the call for service in the realm of Osiris. At first made of stone or wood, by the end of the 18th dynasty ushabtis were almost always made of glazed faience. The many-coloured type was afterwards replaced exclusively by plain blue, with the name of the deceased, and usually also the 6th chapter of the Book of the Dead, inscribed in black. In the tomb of Seti I there were found 700 ushabtis, and in

the Saite age 400 were regularly enclosed in partitioned boxes in each tomb.

Ushak. Town of Asiatic Turkey. In the vilayet of Kütahya, it is about 120 m. E. of Izmir, with which it is connected by rly. It is famous for its carpets. Pop. est. 17,000.

Ushant. English name for the island of Ouessant, dept. of Finistère, France. The westernmost of the islands of Brittany, it



Usk, Monmouthshire. Ruined keep of the Norman castle
Valentine

lies 26 m. W. by N. of Brest. Of granite formation, bare and treeless, it measures about $4\frac{1}{2}$ m. in length, and is surrounded by small islets and rocks. A small port, Ouessant, lies to the W., and there are fortifications. On July 27, 1778, an indecisive naval engagement took place off Ushant, between the English fleet, under Keppel (*q.v.*), and a French fleet, under d'Orvilliers. In 1794 Howe gained the victory of the Glorious First of June over the French off Ushant. The island was known to Pliny as Uxantos. Pop. est. 3,000. Pron. Ush-ant.

Ushaw. Village of Durham, England, lying on moors 4 m. W. of the cathedral city. It is known principally for the R.C. college and seminary of S. Cuthbert, where men have been trained for the priesthood since 1804. This is the successor of a similar college at Douai (*q.v.*) closed in 1793, students having been accommodated at Crook Hall, Durham, in the interval. Under the presidency (1837-63) of Charles Newsham great extensions to the buildings were carried out, and in

1883 a third church was added. Classics dominate the curriculum, and about 300 students are taken by the college. Educated here were Cardinals Wiseman and Bourne, Francis Thompson, and Lingard, who bequeathed his books and papers to Ushaw.

Usk. River of S. Wales and Monmouthshire. An affluent of the Severn, it rises on the border of Carmarthenshire and Brecknockshire, cuts between the Brecknock Beacons and the Black Mts., continues S.E., and reaches the lowlands at Abergavenny, whence it flows S. to the Bristol Channel. The lowest reach, $3\frac{1}{2}$ m., is navigable to the seaport of Newport, where there are good docks.

Usk. Market town of Monmouthshire, England. It stands on the river Usk, 11 m. S.W. of Monmouth. There are ruins of a castle built in the 12th century as a defence against the Welsh. The church of S. Mary also dates in part from the 12th century, having been originally that of a Benedictine nunnery. The town has an agricultural trade, a nylon factory, and is a centre for salmon fishing. It occupies the site of a Roman settlement. Pop. 1,600.

Üsküb. Turkish name for a Yugoslavian town, described under its Yugoslav name of Skoplje.

Uskudar. Town of Asiatic Turkey. It is in the vilayet of Istanbul and stands opposite that city on the E. shore of the Bosphorus. The Anatolian rly. starts here. Anciently called Chrysopolis (golden city), the place was known to the west as Scutari when Florence Nightingale organized the hospital during the Crimean War. There are many



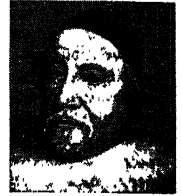
Uskudar, Asiatic Turkey. Water-front of the suburb facing Istanbul

mosques, a palace, barracks, and other buildings of the dynasty of sultans, and a vast and beautiful cemetery. Silk, muslin, and cotton goods are made. The name means courier. Pop. 100,000.

Uspallata. Pass in the Andes, S. America. It lies on the route from Mendoza, Argentina, to Valparaiso, Chile. The summit at La

Cumbre is 12,795 ft. high. Below it is the tunnel of the Transandine rly. at a height of 10,390 ft.

Ussher OR **USHER**, **JAMES** (1581-1656). Irish prelate. Born in Dublin, Jan. 4, 1581, he was educated at Trinity College there, and was ordained in 1601. He became chancellor of S. Patrick's cathedral, Dublin, in 1603, regius professor of divinity at Trinity College in 1607, was consecrated bishop of Meath in 1621, and translated to Armagh four years later. During his closing years he was preacher at Lincoln's Inn, London, and he died at Reigate, March 21, 1656. One of the greatest scholars of his age, he calculated the chronology which is to be found in old editions of the Bible, and was the author of Antiquities of the British Churches, Annals of the Old and New Testaments, and Annals of the World—all in Latin.



James Ussher,
Irish prelate

U.S.S.R. Initials representing Union of Soviet Socialist Republics. The names of the individual republics are listed under that heading, and each has its own entry. See also Russia.

Ussuri. River of E. Asia, a tributary of the Amur, which it joins near Khabarovsk, in the Far Eastern Region of the U.S.S.R. It flows N.N.E. from Lake Khanka, and for much of its course divides Russia from Manchuria. It is about 500 m. long. On its banks an agricultural industry has been

developed. The Ussuri is navigable, and its valley is used for the rly. to Vladivostok.

Usti. Czech name for the Bohemian town described under its German name Aussig.

Usufruct (Lat. *usus et fructus*, use and enjoyment). Term of Roman law. It means the right to use anything belonging to another,

such as land, and to enjoy its profits or fruits, provided that the substance is not wasted.

Usumacinta. River of Central America. It rises in the mts. of W. Guatemala and traverses that country eastward, then flows N.W. across S. Mexico to reach the Bay of Campeche after a course of 400 m. The lower course is navigable for a short distance from the sea, the middle course is the boundary between Mexico and Guatemala, and the upper course is in an almost unexplored jungle forest.

Usury (ultimately from Lat. *uti*, to use). Originally, any interest payable for the loan, i.e. use, of money. The word soon acquired a derogatory sense. Taking usury or interest from the Hebrews was expressly forbidden by the Mosaic Law (Ex. 22, v. 25; Lev. 25, vv. 35-37; Deut. 23, vv. 19, 20), and the practice was regarded by the Christian Church as a form of robbery down to the 16th century. In England from the reign of Henry VIII onwards many statutes were passed regulating the rates of interest; 10 p.c. was allowed in 1545. All these were repealed in 1854, but moneylenders' charges are liable to variation if proved to the satisfaction of the court to be harsh or excessive, and pawnbrokers' rates are strictly regulated by law. See Interest; Money-lender; Pawnbroker.

Utah. Lake in the state of Utah, U.S.A. It is some 20 m. long, with an extreme breadth of 11 m., and lies 4,490 ft. above sea-level. The river Jordan carries its surplus waters northwards to the Great Salt Lake (*q.v.*).

Utah. State of the U.S.A. In the Rocky Mts. area, bounded N. by Idaho, N.E. by Wyoming, E. by Colorado, S. by Arizona W. by Nevada, it covers 82,346 sq. m. The picturesque Wasatch Mts., penetrated by deep cañons, traverse the central part of the state from N. to S. To the E. are the Uinta Mts., and farther S. broken groups occur, while the area W. of the Wasatch Mts. forms part of the Great Basin and has a consistent elevation of about 5,000 ft. The Colorado, with its tributaries, drains the E.; the rivers of the W. have no outlet and discharge into the Great Salt, Utah, and other lakes. The soil is generally sterile except when irrigated, and only 3·3 p.c. of the area is tilled land; about 1 p.c. is "dry farmed" on soil which, though not irrigated, is made productive by a rainfall exceeding 10 ins. per year. Livestock dealing is important; but

mines containing all the generally known metals furnish employment to half the working pop.

The rlys. have a total length of 2,400 m. but air travel has to some extent superseded other modes of transport. Schools have been unsectarian since a dispute with the Mormon church as to religious instruction ended in 1921. Utah university provides higher instruction. Of the world total of 760,000 Mormons, two-thirds are in Utah, which was founded in 1847 when Brigham Young led his followers thither, calling the land Deseret. By the help of irrigation the Mormon settlers succeeded in establishing agriculture (the principal product being beet sugar) in soil that before their coming was little better than desert. Utah was refused admission to the Union so long as the Mormons continued the practice of polygamy; it was admitted in 1896, Salt Lake City being the capital and by far the largest place. Two senators and two representatives are sent to congress. Pop. 550,310. Consult Mormon Country, W. E. Stegner, 1941.

Utakamand. Variant spelling of the Indian hill station of Ootacamund (*q.v.*).

Uterus or **WOMB.** Organ in which the foetus or immature offspring develops and is nourished before birth. The uterus in the human female is a pear-shaped body about 3 inches. long, within the pelvis. The broad upper part is called the fundus, and to it are attached the Fallopian tubes in which conception or the union of ovum and spermatozoon occurs. The central part of the organs is termed the body. The lowest part, the neck or cervix, projects into the vagina and contains an opening termed the os. The cavity of the unimpregnated uterus is triangular.

Externally the uterus is covered by the peritoneum, and internally by the mucous membrane, the wall of the organ consisting of muscular tissue. During pregnancy the uterus expands greatly and occupies a considerable part of the abdominal cavity. After delivery it contracts again, but always remains slightly enlarged as compared with the virginal state.

Displacement of the uterus, which may be backwards, forwards, sideways, or downwards, is not an infrequent result of pregnancy and labour. The most prominent symptoms of this condition are aching pains in the back and interference with the function of menstruation. Many cases can be

relieved by wearing an appropriate pessary, but in severe cases an operation for replacing the uterus into its normal position may be necessary.

Inflammation of the mucous membrane of the uterus is called endometritis. When the muscular substance of the organ is involved the term metritis is sometimes used. The condition is most often due to gonorrhoea or septic infection following labour or attempts at abortion. In an acute case the most marked symptoms are rise of temp. and purulent discharge from the vagina. If the infection spreads to the Fallopian tubes or other adjacent organs, or involves the peritoneum, there is grave danger to health.

The commonest tumour in women who have not borne children is a fibromyoma, usually known as a fibroid. This is non-malignant, i.e. does not tend to spread to other parts of the body, and, unless large, is usually curable by an operation which does not involve serious risk to life. Cancer of the uterus is much more frequent in women who have had children. The first symptom is generally haemorrhage from the vagina, having no relation to the menstrual periods. Later, pain, wasting, and offensive discharge occur. If the disease is diagnosed early there is very good prospect of complete removal of the growth by a surgical operation.

Utes. Group of N. American Indian tribes, mainly in Colorado and Utah, whence they are named. Of Shoshonian stock, they number only some 2,000. Warlike hunters, without agriculture, their comparatively early acquisition of the horse gave them their success in raids on their neighbours. See American Indian colour plate.

Uther Pendragon. Legendary chief king of Britain and father of King Arthur. His story is set forth in the British History of Geoffrey of Monmouth, and is also told in the opening chapters of Malory's *Morte d'Arthur*.

Uthwatt Report. Report of a British committee appointed in Jan., 1941, to make an objective analysis of the payment of compensation and recovery of betterment in respect of public control of the use of land. It was presided over by Mr. Justice Uthwatt (1879-1949), and submitted an interim report advising that the govt. should declare that payment of compensation in respect of the public acquisition or control of land would not exceed sums based

on the standard of values at March 31, 1939.

In the final report published Sept. 10, 1942, post-war reconstruction was taken to mean rebuilding devastated areas combined with reconstruction of areas that needed it. It was assumed that there would be national planning to achieve the best possible use of land. As regards undeveloped land, i.e. rural land or land in towns not built over, the committee declared that there should be a balanced allocation of space for agriculture; for open spaces, playing fields, coastal areas, national parks; for transport—roads, rlys., aerodromes; for requirements of defence; and perhaps for completely new dwelling areas. The most suitable land for each purpose should be selected, irrespective of the values attaching to individual pieces of land. Rejecting the proposal of immediate nationalisation, the committee recommended that rights of development should be vested in the state on payment of fair compensation, there being compulsory powers of acquisition.

As regards developed land, i.e. that built over, the main requirements were considered to be widening of existing roads; provision of more open spaces; rebuilding of bombed and overcrowded areas; rehousing of displaced people; provision of amenities and cultural facilities—schools, libraries, cinemas, etc.; provision of industrial necessities—docks, offices, factory sites, etc. Interference with existing users and buildings would be much greater than on undeveloped land, so the cost of compensation might well be enormous.

In 1944 a white paper on urban development laid it down that owners of land should continue to enjoy development rights but their schemes must be approved by a planning authority. Fair compensation for loss of development value as at March 31, 1939, would normally be payable, and compulsory purchase was recognized. Under the Town and Country Planning Act carried in 1947, the planning authority received the right to designate land for compulsory purchase. See Town and Country Planning.

Utica. Ancient city of N.Africa. Founded by the Phoenicians, it was the greatest city of ancient Africa after Carthage, and was situated 20 m. N.W. of that city. It was generally the ally of Carthage, but in the Third Punic War sided with the Romans, and on the

fall of Carthage was granted the greater part of that territory. Here occurred the last stand of the Pompeian party against Caesar and here the younger Cato killed himself. The remains of the ancient city include the amphitheatre, an aqueduct, and ruins of the artificial harbour.

Utica. A city of New York, U.S.A., the co. seat of Oneida co. It stands on the Mohawk R., 94 m. W.N.W. of Albany, and is served by the New York Central and other rlys., and by the state barge canal. It is noted for the number of its charitable institutions. About one-third of the pop. is engaged in the textile industry. There is a large arms industry; during the First Great War the city's production of Lewis guns reached two-thirds of Great Britain's entire output. Y Drych, the only American periodical in Welsh, is published at Utica. Settled in 1786, and incorporated in 1798, Utica became a city in 1932. Pop. 100,518.

Utilitarianism (Lat. *utilis*, useful). System of ethics which sets up as the rule of conduct the best interests either of the individual or of the community. It had its beginnings, in the more selfish form, in the hedonist schools of the Cyrenaics and Epicureans, and, indeed, till the 18th century its aim was held to be the acquisition of pleasure.

A scientific system was first formulated by Jeremy Bentham. According to him the object to be aimed at was the greatest happiness of the greatest number. His theories took no account of the quality of pleasure, a defect remedied by J. S. Mill, who modified Bentham's doctrine by introducing the view that certain pleasures possessed an intrinsic value which rendered them superior to others.

Herbert Spencer registered a further modification in the form of evolutionary influences. Certain methods of conduct in the same conditions, he thinks, will produce the same results, either good or bad. There exists, therefore, an experience of humanity which is superior to our own judgements and idiosyncrasies. When the evolutionary process is complete the conformity between the individual and his surroundings will also be complete. See Bentham; Mill, J. S.; Spencer, H.

Utility Goods. Term used in Great Britain in the Second Great War and after to describe consumer commodities made to specifications standardised by the board

of trade and sold to the public at a fixed price. Most utility goods were exempt from purchase tax. Utility cloth and clothing were introduced in 1941 and labelled CC41; restrictions on trimmings, initiated at the same time, were later dropped. Also in 1941 utility lighters, of brass and plastic, were introduced. In 1942 utility pottery and enamelware were placed on the market, and in the next year utility furniture, cutlery, and household textiles, including carpets.

U Tin Tut (1895–1948). Burmese politician. Born Feb. 1, 1895, and educated at Dulwich and Queen's



U Tin Tut,
Burmese politician

College, Cambridge, he studied law. In 1922 he entered the Indian civil service, the first Burmese to do so. During the Second Great War, when Burma was

overrun by the Japanese in 1941, he was appointed secretary to its cabinet at Simla, and in 1947 was one of the delegation under U Aung San which visited London to discuss the constitutional position. High commissioner in London, he was recalled to Rangoon as foreign minister in the first free Burma government. In 1948 he was again in London negotiating the treaty of independence. Having resigned in Aug. his post as foreign minister to become inspector-general of Burmese auxiliary forces, this pro-British Liberal was assassinated by Communists in Rangoon, Sept. 18.

Utopia (Gr. *ou topos*, nowhere). Romance by Sir Thomas More (*q.v.*). It describes an imaginary island commonwealth based on the idea of community of goods. Written in Latin, and published at Louvain, 1516; Paris, 1517; Basel, 1518; and Venice, 1519, it first came out in English, translated by Raphe Robynson, in 1551. More's work, which gave rise to the epithet Utopian, applied to any desirable but impracticable reform, was indebted in part to his study of Amerigo Vespucci's *Voyages*, Plato's Republic, and Augustine's *De Civitate Dei* (The City of God). With it may be classed Bacon's fragmentary New Atlantis and Thomas Campanella's *Civitas Solis* (City of the Sun). Editions by J. H. Lupton, 1895, and G. Sampson, 1914, may be mentioned.

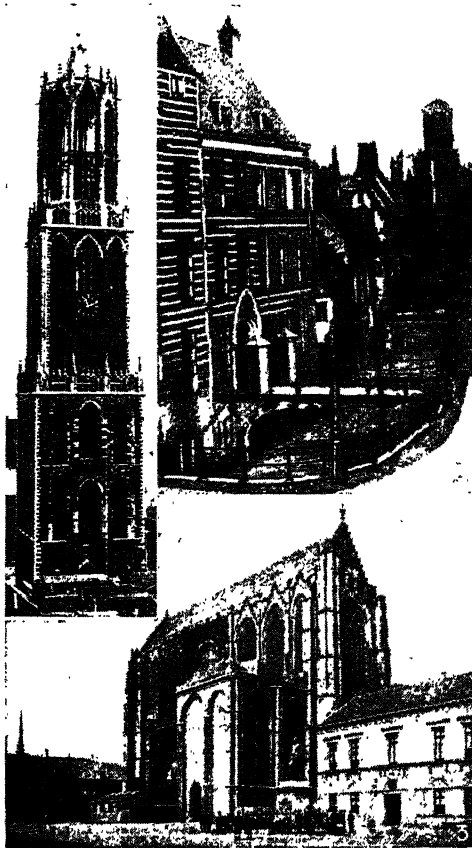
Utopia Limited, OR THE FLOWERS OF PROGRESS. Comic opera by W. S. Gilbert, with music by Arthur Sullivan. Produced Oct. 7, 1893, at the Savoy Theatre, London, it ran for 245 performances. A scene in which the court of S. James's was parodied in terms of a coloured minstrel show caused some offence; but the piece, anyway, proved less enduring than other Savoy operas, and dropped from the repertoire. It is rarely played now.

Utraquists. Name applied to those followers of John Hus (*q.v.*) who demanded the reception of communion in both kinds (Lat. *sub utraque specie*). They are also known as the Calixtines (*q.v.*).

Utrecht. Smallest prov. of the Netherlands. It lies contiguous with the provs. of Gelderland, S. Holland, and N. Holland. The prov. has a flat surface, with good rly. and waterway communications. The chief rivers are the Eem, Vecht, Amstel, Neder Rijn, Kromme Rijn, Lek, and Yssel. Livestock is extensively bred, and dairy produce, especially Gouda cheese, is important; cereals, fruit, and vegetables are also grown. Industries are chiefly concentrated in the capital, Utrecht. Other notable towns are Amersfoort, Amerongen, Doorn, Driebergen, and Zeist. Area, 526 sq. m. Pop. est. 544,656.

Utrecht. Fourth largest city of the Netherlands, capital of the prov. of Utrecht. It lies on the Kromme Rijn (Crooked Rhine), which branches into the Vecht and Old Rhine, 2½ m. by rly. N.E. of Rotterdam, and has two rly. stations, a junction, and rly. engineering sheds. Industries include engineering, distilling, and the manufacture of cloth and woollens, carpets, glass, motor cars, tobacco, chemical products, pottery, and tiles. The town, a financial and commercial centre, is the seat of a cardinal-archbishop.

The Oude Gracht (old canal) and the Nieuwe Gracht (new canal) run through the centre of the town, the main part of which is surrounded by the Buiten Gracht (outer canal). These, with their bridges and old houses, are a picturesque feature of Utrecht. The Gothic cathedral of S. Martin, an 8th century foundation, was begun in 1254 on the site of older buildings, and finished in the 15th century. The tower (338 ft.) has a carillon of 42 bells. Close by is the principal building of the university, founded in 1636, which has a fine library and geological and zoological museums. Pop. 183,251.



Utrecht, the Netherlands. 1. 14th century cathedral tower, which was isolated from the cathedral when the nave was blown down in 1874. 2. Ancient house built by Pope Adrian VI. 3. The existing cathedral

Utrecht was the Roman Trajectum ad Rhenum. It became the seat of powerful episcopal princes in the late 7th century, their temporal power being yielded to the emperor Charles V in 1528. In 1579 the seven provs. here formed the Union of Utrecht. Occupied by Louis XIV, 1672, the city was also taken by the French in 1795, and was the capital of the French dept. of Zuyderzée until 1814. Under German occupation from May, 1940, Utrecht was liberated only after the final capitulation, May 5, 1945; but the Germans retired to the E. for a few days in Sept., 1944, at the time of the air landings at Arnhem, expecting that operation to succeed.

Utrecht, PEACE OF. Name given to the treaty signed at Utrecht in 1713, and sometimes to the whole group of treaties, including those of Rastatt and Baden, 1713-15. The actual treaty of Utrecht put an end to the War of the Spanish Succession. After a preliminary

agreement in London, a congress met at Utrecht in Jan., 1712. Great Britain, France, Savoy, Portugal, the Emperor, Prussia, and the Dutch republic were represented, and later Spain. In March and April, 1713, the main treaties were signed. Others followed, that between Spain and Portugal being delayed until 1715.

France ceded Newfoundland, Acadia or Nova Scotia, the district around Hudson Bay, and St. Kitts to Great Britain, which had conquered them. From Spain Great Britain acquired Gibraltar and Minorca, as well as the monopoly of the slave trade with Spanish America, called the *Asiento*. Louis XIV recognized the Protestant succession, and promised not to aid the Stuarts. Great Britain and France also

concluded a commercial treaty.

The crown of Spain, with its American possessions, was given to the French claimant, Philip V. It was stipulated, however, that the same person should never be king of both France and Spain. Philip's Austrian rival, the emperor Charles, was consoled with Naples, Milan, Sardinia, and the Spanish, henceforward called the Austrian, Netherlands; all these had been Spanish. Prussia, recognized as a kingdom, received part of Gelderland; France promised to secure the title of king for the duke of Savoy, who took Sicily.

The treaty of Utrecht was bitterly denounced in England by the Whigs, and four of those responsible for it were impeached. See Europe; consult Cambridge Modern History, vol. v., 1908.

Utrera. Town of Spain, in the prov. of Seville. It lies 17 m. S.E. of the city of Seville, with which it is connected by rly., in a fertile plain adjacent to the river Guad-

aira. Parts of the medieval walls and fortifications still exist. Spirits, flour, leather, soap, and oil are the principal products. Pop. 21,500.

Utrillo, MAURICE (b. 1884). French painter. Son of the painter Suzanne Valadon, he was born in Paris, Dec. 25, 1884, and educated there. From 1909 he exhibited regularly with the Salon des Indépendants; during this period he painted the famous series of street scenes and buildings in Montmartre, chiefly in white tones, e.g. Rue St. Rustique, Cabaret du Lapin Agile. He was more concerned with design than with strict representation, and his use of the palette knife and delicate colour effects placed him among the group which developed the Post-Impressionist manner. His Place du Tertre is in the Tate Gallery. Studies were written by F. Cano, 1921; G. Tabaraut, 1926; G. J. Gros, 1927.

Utsunomiya. Town of Japan, in the is. of Honshu, 66 m. by rly. N. of Tokyo. The 11th cent. castle was built by the founder of the Utsunomiya clan. Pop. 61,666.

Uttar Union or **UTTAR PRADESH**. Name since 1950 of the United Provinces (*q.v.*) of India.

Uttoxeter. Urban dist. and market town of Staffs, England. It is 15 m. N.E. of Stafford, near the river Dove, and has rly. stations. The chief building is S. Mary's church, modern save for the tower. There is a grammar

long and giving rise to a cough, it may be snipped. *See* Throat.

Uxbridge. Urban dist., giving its name to a co. constituency of Middlesex, England. About 14 m. W. of London, it has rly., bus, trolley bus, and Green Line services. Here also the Grand Union Canal runs between two branches of the Colne. The 15th century church of S. Margaret was restored in 1872. Ironfounding, brickmaking, and brewing are the chief industries, and there is an important R.A.F. barracks, an intake centre for recruits, and training centre for R.A.F. police. An ancient borough and market town, Uxbridge was granted a weekly market and an annual fair in 1294. Lynch Green was the scene of burnings at the stake in 1555. At the Crown, or Old Treaty House, there met in 1645 the abortive conference between 16 commissioners of Charles I and representatives of parliament. Pop. est. 52,000.

Uxmal. Ruined city of Mexico, in the W. of Yucatan state. Situated 37 m. S. by W. of Mérida, it has many magnificent ruins, including one called the governor's palace, a remarkable structure 320 ft. long, 40 ft. wide, and 25 ft. high, containing many fine sculptures. *See* Maya.

Uzbek or **UZBEK**. People of Turkic descent in Soviet Central Asia. Numbering some 600,000, especially in what used to be W. Turkistan, with numerous congeners in Afghanistan and Sinkiang, they represent a confederation formed E. of the Caspian

after the break up and disintegration of the Golden Horde (*q.v.*).

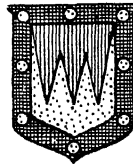
Uzbek. Asiatic republic of the U.S.S.R. Created in 1924, it includes the old dists. or provs. of Khiva, Bokhara, Samarkand, Fergana, and Khokan (*qq.v.*), and the Kara-Kalpak autonomous republic. It borders all the other republics of Soviet Central Asia and on the S. touches Afghanistan, covering 159,170 sq. m. The capital is Tashkent, the eighth largest Russian city; there were in 1948 nine regions, not counting Kara-Kalpak. Less than a quarter of the pop. of

6,282,450 is urban; racially Uzbeks predominate, and in religion the Sunnite form of Islam. The rich history of this region is sketched in articles on the places mentioned, but broadly it shows a struggle between Mongols, Turks, and Persians, all making use of the native tribes, until Russia took the conquest in hand in the mid-19th century. Bokhara and Khiva retained a partial independence until the 1917 Revolution, and fought against the Soviet regime. In 1925 Uzbek S.S.R. or Uzbekistan had its present status recognized.

Watered by the Amu-Daria (Oxus), Syr-Daria, and Zerafshan, but with a continental climate and usually scanty rainfall, the republic depends on great irrigation schemes, which have rendered it the chief cotton-growing area in Russia and a land of intensive farming. Just before the Second Great War many canals and reservoirs were finished. Raw cotton grown in 1939 came to 1,600,000 tons. Silk is produced; among cereals are wheat, barley, maize, and lucerne; among fruit, grapes, melons, and almonds. Huge coal deposits were struck during the war, and oil, copper, building stones, and ozokerite occur. The Tashkent region is highly industrialised, making cement, leather goods, paper, and agricultural machines. Hydro-electric power is rapidly being adopted. Except Khiva, all the big towns are on the Turk-Sib rly. *Consult* History of the Mongols, H. Howorth, 1876; Soviet Asia, R. A. Davies and A. J. Steiger, 1943.

Uzhgorod (Magyar, Ungvar; Czech, Uzhorod). Town of Ukraine S.S.R. It lies 80 m. N.N.E. of Debreczen. Before the First Great War it was capital of the Hungarian co. of Ung; after that war it was capital of Ruthenia, Czechoslovakia, and the seat of a Uniat bishop. In the area ceded to Hungary, March, 1939, it was captured during the Second Great War by the Russians on Oct. 27, 1944, a victory which virtually cleared the Germans from Ruthenia. With that district, it was absorbed into the U.S.S.R. in 1945. Uzhgorod, which makes pottery, is the seat of a state university. Pop. est. 17,000.

Uzziah or **AZARIAH**. King of Judah. Son of Amaziah (*q.v.*), whom he succeeded at the age of 16, he is said to have reigned 52 years. He restored the town of Elath, and when he became a leper his son Jotham acted as his representative. *Consult* 2 Kings 14 and 15; 2 Chron. 26.



Uxbridge arms



Uttoxeter, Staffordshire. Market Place and High Street

school dating from 1558, and the place has associations with Johnson. Agricultural implements, biscuits, and dairy produce are made, and there is a large agricultural trade. Uttoxeter was made a borough about 1200, and was long in the duchy of Lancaster. It had fairs, and its markets were important until about 1800. Market day, Wed. Pop. (est.) 7,130.

Uvula. Elongated muscular process covered with mucous membrane, which projects from the free margin of the soft palate. It shares in any local inflammation. If too

UP to a relatively late date the story of the letter V is that of the letter U, for the two were scarcely differentiated until the 15th century. Some scholars find its origin in the Semitic letter *vau*, which represented approximately the sound now represented in English by W. This would mean that even in its derivation V was closely allied to F (see F). The Greek digamma **F** also represented



the w sound. The Latin alphabet adopted the digamma, first introducing the combination FH to represent the consonant sound off, but eventually eliminating the H. The w sound had therefore to be represented by some other symbol, for which purpose the early Chaldean form **V** of the Greek up-silon was adopted. For difference of distinction between V and U see U; and for that between V and W, see W.

V Twenty-second letter of the English and Latin alphabets, if it be regarded as distinct from U in the latter. It is a soft labial, or lip-sound, corresponding to the hard *f*. In printed and written form it is a variant of U. In the Latin alphabet it fulfilled the double function of vowel and consonant in early times, but in a later age *u* became exclusively used as a vowel. Its sound is invariable, as in *vat*, *love*. See Alphabet; Phonetics.

V. Symbol of victory which became popular in Great Britain and on the Continent during the Second Great War. See V Campaign; VE-day; VJ-day.

Vaagso. Island of Norway. Situated 100 m. N. of Bergen, on the coast of Sogn-og-Fjordane, it has a pop. of 250, whose only industry is a fish-processing factory. After the German invasion of Norway, the island was developed as a radio station and refuelling base for German light coastal craft. At dawn on Dec. 27, 1941, a British and Norwegian force was landed by the R.N. under cover of the R.A.F. After some resistance from the German garrison, control of the town was gained, and all military installations on shore and some 15,000 tons of German shipping in the harbour were destroyed. About 100 German troops and Norwegian quislings were taken prisoner. With the simultaneous raid on Maaloy, this was the first use of Combined Operations (*q.v.*).

Vaal, KAI GARIEP, OR YELLOW RIVER. River of S. Africa. It rises in the Rand Berg, in the Ermelo dist. of Transvaal, and below Standerton forms for nearly all its westward course of 500 m. the boundary between Transvaal and the Orange Free State. Chief tributary of the Orange river, it falls thereinto below Douglas, in the Cape Province.

The Vaal barrage, 19 m. below Vereeniging, was opened in 1923 at a cost of £1,320,000; it holds back the river for 42 m. and forms a reservoir of 13,633 million gallons. The Vaal dam begins 18 m. upstream from that town and is the biggest work of its kind in the

S. hemisphere, being up to 15 m. across; it supplies water to Johannesburg and environs.

Vaal-Hartz. Irrigation project, the biggest in the S. hemisphere. The area concerned is between Taunags and Border, on the boundary between Cape Province and Transvaal, S. Africa. First mooted in 1881, the project was authorised by parliament in 1934. The rivers Vaal and Hartz flow parallel about 20 m. apart, but the bed of the former is about 450 ft. higher, and its water has been caused to irrigate about 150 sq. m. in the Hartz valley. Water is also supplied to the vast gold-mining and industrial area of the Rand. The principal dam, near the confluence of the Vaal and Wilge, is 135 ft. high, 1,900 ft. along the crest, and has a submerged area of 62 sq. m.

Vaalpen (Boer, grey-paunch). Primitive negro tribe. They live mostly in the Magalakwane valley between the Waterberg and Zoutpansberg dists., Transvaal. Dwarfish black hunters and trappers, they can produce fire, but have no handicrafts. Occupying caves, rock-shelters, and underground hovels, they comprise a few family groups, each under a domestic headman.

Vacation (Lat. *vacare*, to be empty, unoccupied). Interval of time between two periods of regular work. The word is specifically applied to the intervals between law and university terms. See Term.

Vaccination (Lat. *vacca*, cow). Term popularly applied to protective inoculation against small-pox. The human system, having once survived an attack of small-pox, contains for some years an excess of protective substances rendering it immune from further attacks. Even if the original illness is mild, this same effect is produced, and in ordinary vaccination the protection is obtained by deliberately inoculating the person with a very attenuated form of the disease, namely, cow-pox. The nature of the virus in small-pox and cow-pox is essentially the same. In a previously healthy bovine animal,

in practice a calf, the disease appears as a pustular rash, but not a severe illness. The virus is present in the lymph which exudes from this rash, and for medical use is collected from the calves with every aseptic and sanitary precaution, in the U.K. under strict official supervision.

When a small quantity of this infective calf lymph is placed in intimate contact with a scratch in the human skin, the person becomes infected at that point with the weakened form of the disease, the typical vaccination pustule appearing in about four to five days, followed by immunity to small-pox itself which is almost complete for five or six years, but thereafter gradually weakens. Nevertheless, although the complete protection dies out, a modifying power remains, and therefore, if a vaccinated individual does contract small-pox many years later, the disease is mild, and the rash leaves little or no scarring.

A person who has been exposed to small-pox should always be vaccinated immediately, unless this has lately been done. The incubation period of cow-pox being about four days, whereas that of small-pox is about 12, if vaccination be carried out even six days after the exposure, then prevention or at least modification of the small-pox may still result.

In 1721 Lady Mary Montagu introduced from Turkey the practice of putting into healthy individuals lymph from the rash in mild cases of actual small-pox. The aim was to protect these people by giving them as light an infection as possible, after which they became immune. Towards the end of the 18th century, when small-pox was rampant in England, the practice of variolation, as it was termed, became very common. Indirectly the results were good, since, although the mortality from variolation was in itself 2 p.c., yet among un-inoculated people infected with small-pox nearly 30 p.c. died. In 1796 vaccination was discovered. It was before that time well known among farmers and dairy-

men in the west of England that cow-pox was contracted through a scratch on the hand while milking an infected animal. They found also that those who had suffered from the eruption produced upon the hands and arms did not develop small-pox. Edward Jenner (*q.v.*) inoculated a boy with lymph from a case of cow-pox and found six weeks later, when he tried to inoculate him with virulent small-pox, that the disease would not develop. This new vaccination became rapidly and widely popular. As a result, not only was the incidence of small-pox remarkably reduced, but its severity also. During the 18th century, about 9 p.c. of the mortality in England was due to small-pox. About 1875, when vaccination was compulsory, this figure had fallen to 1.5, and since then it has decreased to a negligible quantity: a condition, however, for the achievement of which improved sanitation must be taken into account.

The first English legislation on vaccination dates from the Vaccination Act of 1840, which prohibited variolation and recommended vaccination. In 1853 came a Compulsory Vaccination Act, which ordered that every child should be inoculated before reaching the age of three months. Acts of 1867 and 1887 amended and superseded these; the age limit was raised to six months, and provision was made for conscientious objection on the part of the parents. All were repealed in 1946 by the National Health Service Act, which requires local authorities to arrange with medical practitioners for persons to be vaccinated.

Vaccine. Emulsion of dead bacilli intended to be injected into the system for the treatment or prevention of disease. This method of preventive medicine has now been applied to many infectious diseases, often with highly satisfactory results, one of the most striking instances being the immunity conferred against typhoid. Vaccine therapy recognizes that defence mechanisms of the body are challenged by the presence of measured poisonous material. These mechanisms are thus ready to repel the attacks of the living germ or virus should it attack the animal organism. See *Bacillus*; *Inoculation*; *Vaccination*.

Vaccinaceae. Botanical name for the bilberry family of shrubs and small trees, natives of temperate and tropical regions. By

some authorities they are included in the family Ericaceae. They have usually alternate, undivided, evergreen leaves, and bell-shaped or tubular flowers. The fruits are mostly berries, useful as anti-scorbutics. See *Cranberry*; *Whortleberry*.

Vachell, HORACE ANNESLEY (b. 1861). British novelist and dramatist. Born Oct. 30, 1861, he was



Horace Annesley Vachell.

Russell

educated at Harrow and Sandhurst, and became an officer in the Rifle Brigade, but took to literature and wrote successful novels and plays, in which the study of character rather than of incident predominates. His novels include *The Shadow Third*, 1902; *Brothers*, 1904; *The Hill*, 1905, a sympathetic story of school life at Harrow; *The Face of Clay*, 1906; *The Waters of Jordan*, 1908; *Quinney's*, 1914; *The Fourth Dimension*, 1920; *Quinney's Adventures*, 1924; *A Woman in Exile*, 1926; *Vicars' Walk*, 1933; *Joe Quinney's Jodie*, 1936; *Quinney's for Quality*, 1938; *Quiet Corner*, 1948. A dramatized version of Quinney's was presented in 1915, and Vachell wrote other plays, alone and in collaboration. He also published memoirs, *e.g.* *Distriet Fields*, 1937; *Now Came Still Evening On*, 1946; *Twilight Grey*, 1948.

Vacuum. Space from which matter has been partially or wholly exhausted. A high vacuum is usually taken to imply pressures less than 10^{-5} atmospheres, *i.e.* approx. 10 dynes per sq. cm. Radio, X-rays, low pressure distillation, evaporation of metals on surfaces, etc., all require vacuum technique. To provide a vacuum a pump is generally used. There are two main classes of vacuum pumps, those which work at atmospheric pressure and those requiring a reduced pressure. Typical of the first class is the oil-

rotary pump in which a rotor is

mounted eccentrically on its shaft within a cylinder attached to an inlet tube from the system to be pumped out and an outlet tube to the atmosphere. The cylinder is filled with oil having a low vapour pressure. As the rotor revolves it drags air around from the inlet to the outlet. Pressures as low as 10^{-3} mm. of mercury can be obtained with such pumps, which will exhaust spaces of 6 litres per min. Typical of the second class of pump is the mercury (or oil) condensation pump, in which molecules of gas become trapped between molecules of mercury vapour drawn out by a force-pump. The mercury vapour is condensed by a cooling system (using water), and so returned to a heated mercury reservoir. These pumps reach pressures as low as 10^{-6} or 10^{-7} mm. of mercury, and speeds of pumping as high as 70,000 cc. per sec. have been reached.

The absolute measurement of such low pressures is difficult. Gauges have to be calibrated against a standard, in the search for which many physical phenomena have been used, *e.g.* the variation in heat loss from an electrically heated wire as pressure varies, or the change in ionisation current in a thermionic valve with pressure. Gauges have also to be calibrated with the gas in the system under test. Absorption by charcoal at a low temp. is the usual method of removing the last traces of gas.

VACUUM DATA

Units of Pressure

1 atmosphere	= 1.013×10^6 dynes/cm. ²
1 bar	= 10^6 " "
1 millibar	= 10^3 " "
1 microbar	= 1 " "
1 micron (μ)	= 10^{-3} mm. mercury
1 mm. mercury	= 1.33×10^3 dynes/cm. ²
(sometimes called 1 Torr)	

Pressures used in some typical vacuum devices

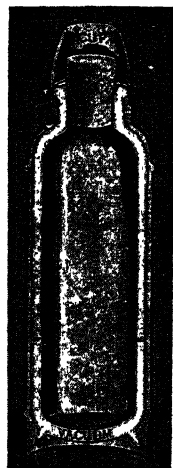
Gas-filled incandescent lamp	500 mm. mercury	
Gas-filled photocell	3×10^{-3} " "	
Gas-filled X-ray and cathode-ray tubes	10^{-2} " "	
Metal-filament lamp	10^{-3} to 10^{-4} " "	
"Sputtering" apparatus	10^{-6} (or less) " "	
Radio valves	10^{-5} (or less) " "	
Vacuum photocells	10^{-6} " "	
Hard cathode-ray tubes	10^{-6} " "	

Vacuum Brake. Type of rly. brake (*q.v.*) acting by pressure differences on each side of a piston in an exhausted air chamber.

Vacuum Cleaner. Mechanical device for the removal of dust and dirt from floors, walls, furniture,

etc., by air suction. The three essentials of a vacuum cleaner are the apparatus for producing the vacuum, i.e. some form of air-pump; the separator, where the dust and dirt are retained from the insucked air; and the nozzle, which passes over the surface being cleaned. Small vacuum cleaners may be worked by foot or hand or electric power from an electric light socket; larger ones are worked by an internal combustion or other engine, and are connected to their work by hose pipes. The shape of the nozzle depends largely upon the use to which the vacuum cleaner is put, and varies from long rectangular to circular. With some types of domestic cleaner removable alternative nozzles may be used.

Vacuum Flask. Glass vessel having a storage chamber or receptacle surrounded by a vacuum space. Liquids placed in vacuum flasks neither lose nor gain heat during more or less lengthy periods. Thus liquefied gases remain in that state, and hot liquids do not cool down.

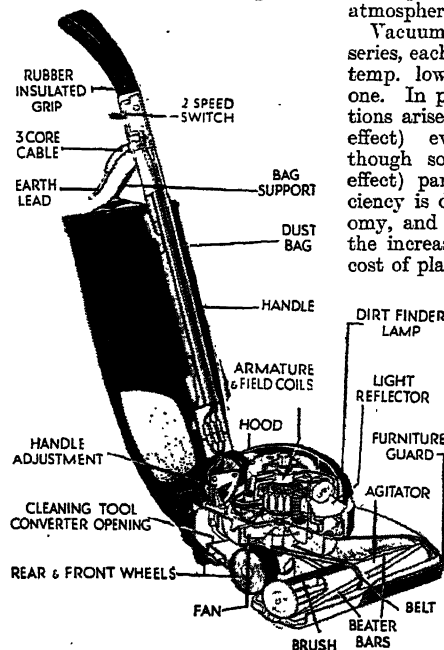


Vacuum Flask. Sectional diagram showing surrounding chamber or vacuum

travellers, etc., have an outer case of thin metal, which protects the glass vessel.

Vacuum Metallurgy. The use of vacua in the smelting, refining, and subsequent treatment of metals is comparatively new and in the experimental stage. A vacuum may be used merely to protect the metal from gaseous attack during some process, usually one involving heat; or to speed up reactions which would take place slowly at normal temperatures and pressures, if at all. Reactions often can be effected at reasonably low temperatures if the pressure is reduced to 0.01 mm. of mercury or less, and so commercial processes become possible. One of the first

was devised by Dr. Pidgeon of Toronto, who during the Second Great War was able to produce



Vacuum Cleaner. Diagram illustrating the construction and working of a vacuum cleaner
Courtesy of Hoover Ltd.

magnesium, needed for aircraft construction, by the reduction of dolomite with ferro-silicon. Processes for the production of calcium, lithium, barium, columbium, titanium, and zirconium are being commercially developed. Many metals may be refined, either by distilling the metal under vacuum or by removing the more easily volatile impurities. A metal may be cast under vacuum to reduce the quantity of gases dissolved in the metal or to prevent its oxidation; and vacuum may be used for protection during heat treatment. Another development is the deposition of metallic coatings after vaporisation of metals under reduced pressure. Such coatings are used on glass for mirrors, on paper for the cheap production of electrical condensers, for decorative purposes, etc.

Vacuum Pan. Device to facilitate evaporation. The boiling point of a liquid falls as the pressure is reduced. In industry the application of a vacuum to an evaporation process may be expedient because it is possible to use waste heat from another process and thus economise in fuel, or because the material under treatment is sensitive to heat and may

therefore be spoiled if exposed to the temp. necessary to evaporate the liquid at reasonable speed at atmospheric pressure.

Vacuum pans often work in series, each being at a pressure and temp. lower than the preceding one. In practice many complications arise and three stage (triple effect) evaporators are usual, though some 5-stage (quintuple effect) pans are used. The efficiency is dependent on fuel economy, and beyond a certain point the increased space occupied and cost of plant and accessories, such

as pumps, etc., becomes excessive. The design and working conditions depend upon the material being handled. Noteworthy examples are used in the salt, soap, sugar, and caustic soda industries.

Vacuum Tube.

Glass tube having metallic wires (preferably ending in flat disks) fused through the ends, forming a connexion between the inside space and a source of high voltage, e.g. 10,000 volts. When it is connected

and the air gradually pumped out, a series of luminous changes occurs. At normal pressure, the air is an insulator, and the tube is dark. Then at an early stage in evacuation, a band of light, called the positive column, stretches from one electrode to the other. As the



Vacuum Tube. Geissler bulbous vacuum tube with serpentine connexion. Right, type known as electric egg

pressure is further reduced, this breaks up into short sections called striae, and a relatively long gap called the Faraday dark space appears near the negative electrode. The striae and a negative glow then move towards the positive electrode, a second gap, the Crookes dark space, intervening at the negative end. With further evacuation, the movement of the bands continues until at a pressure of about a millionth of one atmosphere the Crookes dark space fills the tube. This space



represents the mean free path of the electrons issuing from the negative electrode, and the disappearance of the luminescence indicates that the electron stream has now reached the glass, causing the latter to glow.

There are two sources of luminescence, viz. the rarefied space and the tube itself, and the colours depend on the materials involved, e.g. if the original gas is neon, a bright red colour is given; while the kind of glass, or of powder deposited on its inside surface, determines the colour and brilliance of the fluorescence. Advantage has been taken of these phenomena to produce the various kinds of fluorescent lamp and other discharge tubes.

Small purely decorative vacuum (or "Geissler") tubes have been made for many years, to demonstrate the above principles, two examples being given in the figures; the upper of which shows clearly the negative glow, Faraday dark space, and striae. Details of further vacuum phenomena, including cathode and X-rays, are given under Cathode Ray Tube; Crookes Tube; Discharge Tube; Oscillograph.

Vác OR **VAC**. Town of Hungary. It is situated 20 m. by rly. N. of Budapest, on the left bank of the Danube, where the river turns sharply S. through the Vác Gorge. There are a fine cathedral and the bishop's palace. During the Second Great War Vác was captured by the Russians from the Germans and Hungarians, Dec. 9, 1944. Pop. est. 19,000.

Vaduz. Capital of Liechtenstein. It is 24 m. S. of Lake Constance, on the right side of the Rhine valley at a height of over 1,500 ft. Above it is the castle, rebuilt 1523-26, residence of the ruling family. The town attracted many rich settlers, especially from Germany during the Nazi regime, but also from other countries because of its low taxes. It has many fine houses, a modern church, and the government buildings. The town is the centre of fruit and wine trade, and there is some textile industry. The language is German, the religion mostly R.C. Pop. 2,020.

Vag OR **VAH**. River of Czechoslovakia. It rises in the Carpathians, and flows W. in a steep-sided, narrow valley as far as Zilina, and then, in general, S. between the White Carpathians and the Nitra Mts., to join the Danube after a course of 250 m. Its main affluent is the Arva from the W.

Beskids. The valley is used by the important rly. from Bratislava to Kosice (Kassa).

Vagina. Canal leading from the vulva or external genitals of the female to the entrance of the uterus or womb. See Uterus.

Vagrancy (Anglo-Fr. *valerant*, wandering). Vagabondage or loitering. The Vagrancy Acts in English law give the word a much wider meaning and create a large number of criminal offences, e.g. fortune-telling, or gaming for money in the street, many of which have no connexion with vagrancy in its strict meaning. The early Vagrancy Acts were designed to deal with conditions for several centuries after the break up of the feudal system, when large numbers of workless and homeless persons were wandering the countryside. The Acts dealt with the crimes that such persons were likely to commit, and also assisted the operation of the poor laws. The Vagrancy Act, 1824, which makes it an offence for a person to lodge in the open air (after being directed to accommodation), and to fail to give a good account of himself, is often used for the benefit of persons in need of protection. Persons guilty of offences against the Vagrancy Acts are declared to be idle and disorderly persons, rogues and vagabonds, or incorrigible rogues, a separate punishment being prescribed for each category.

Vagus Nerve. Important nerve on each side of the body, which arises from the base of the brain and passes out of the skull through the jugular foramen, an aperture in the base of the cranium. It proceeds vertically down the neck, close to the carotid artery, and enters the thorax. The right vagus passes behind the root of the right lung, where it forms the posterior pulmonary plexus. From this the nerve continues down behind the oesophagus and passes through the diaphragm or large horizontal muscle, to supply the posterior surface of the stomach and give off branches to plexuses of nerves in the abdominal cavity.

The left vagus passes over the arch of the aorta or main blood vessel, and breaks up behind the root of the left lung into the posterior pulmonary plexus. The nerve subsequently makes its way down through the diaphragm in front of the oesophagus, and is distributed to the anterior surface of the stomach, with branches to various nerve plexuses. The vagus nerve is sometimes called the pneumogastric. See Anatomy; Neck; Nerve.

Vaihinger, HANS (1852-1933). German philosopher. Devoting his whole life to philosophy, he worked at Strasbourg, 1878-84, and Halle, 1884-1906. His most famous book is *The Philosophy of As-If*, which advances the theory that all human ideas are relative, and that human thought is fictitious. He also became an acknowledged authority on Kant and, in 1904, founded the Kant Society, which became the largest body of its kind in the world. Vaihinger died Dec. 17, 1933.

Vair. In heraldry, fur, represented by small cup-like white and blue shields. These are placed in rows, the bases of the white resting on the bases of the blue. In a variant, known as counter-vair, the shields of one tincture are placed base to base. If the tinctures are different from the above, the fact should be mentioned. See Heraldry colour plate.

Vaisya. Third or ordinary class in ancient Hindu society. Described in the Rig-Veda as sprung from the thighs of Purusha, it comprised the free commonalty, the ordinary folk engaged in providing the Aryan community with the necessities of life. To them were entrusted the material interests of agriculture, cattle-raising, handicraft, and trade, apart from those menial occupations which were allotted to the servile Sudras. Their peaceful penetration of the Dravidian population in S. India proceeded for centuries before the Kshatriya class undertook military dominion in that region, and their commercial intercourse with other lands led to much racial admixture. In recent censuses the bulk have been returned under modern caste names. See Caste.

Valais. Canton of Switzerland. It lies between the Bernese Alps on the N. and the Pennine Alps on the S., and comprises the Rhône valley above the lake of Geneva, and a number of tributary valleys. More than a fifth of the area of 2,021 sq. m. is covered with glaciers. Lead, iron, anthracite, marble, and limestone deposits are worked; vineyards, famous for their wine, and orchards occur in the lower valleys; higher the main industry is pastoral.

Conquered by the Romans in 57 B.C., the dist. was then known as Vallis Pennina; Burgundians, Franks, kings of Burgundy and Arles, bishops of Sion, and counts of Savoy held successive sway within it until the 15th century, since which time it has been Swiss, being made a canton in 1815.

An earthquake was recorded here, Jan. 25, 1946.

In the lower Valais in the W. the people are French-speaking; in Upper Valais they are descendants of German Swiss colonists. Sion is the capital. The Simplon and Loetschberg rlys. cross the canton, from which roads lead over the St. Bernard, Simplon, Furka, and Grimsel passes. The Simplon tunnel, opened in 1906, is the longest rly. tunnel in the world (14 m.). A second tunnel, parallel to the first, was completed 1922. Pop. 148,310.

Valdepeñas (Sp., valley of the rocks). Town of Spain, in the prov. of Ciudad Real. It is 140 m. by rly. S.E. of Madrid on the Jabalón river, and on the highway to Andalusia. From it a branch rly. runs to the mercury mines of Almadén. It is almost solely known for the red

châtel to Pontarlier, and is drained by the river Areuse. At St. Sulpice are valuable asphalt mines.

Valdez. Coast town of Alaska. It stands at the head of Port Valdez, an inlet of King William Sound. In the neighbourhood small lode mines are worked for gold. Pop. est. 300.

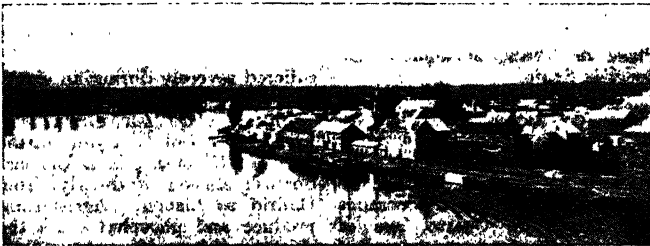
Valdivia. Prov. of S. Chile, adjacent to the provinces of Llanquihue and Cautín and to Argentina. In the W. are the coast ranges, in the E. the Andes; between is a portion of the great longitudinal valley of Chile. The mts. are forested, and lumbering is carried on. The valley is given over to agriculture and grazing. Its area is 7,721 sq. m. Pop. 181,642.

Valdivia. Town of Chile, capital of the prov. of the same name. It is on the Valdivia river, 16 m. from

of Oxford lies between the scarp of the Chilterns and the gentle slope of the Cotswolds.

Valen, **FARTEIN** (b. 1887). Norwegian composer. He was born at Stavanger, and spent his childhood in Madagascar, where his father was a missionary. He studied at Oslo, and under Reger in Berlin. In 1924 he became director of music in Oslo university. In 1935 he was awarded a govt. grant, which enabled him to give all his time to composition. Works include *Pastorale*, *Sonetto di Michelangelo*.

Valence. Town of France, capital of the dept. of Drôme. It lies on the left bank of the Rhône, 66 m. by rly. S. of Lyons, and 4 m. below the mouth of the Isère river. It is a rly. junction, and there is a busy river trade. Among the industries are dyeing, distilling, flour milling, food-preserving, etc. The Romanesque cathedral of S. Apollinaire was consecrated in 1095, suffered severely in the Wars



Valdivia. Riverside quays at this important commercial port of southern Chile

wine produced in the dist. Distilling, tanning, cooperage, and flour-milling are subordinate industries. The town was heroically defended against the French in 1808. Pop. 26,800.

Valdes, **ARMAND PALACIO** (b. 1853). Spanish novelist. See *Palacio Valdes*, Armand.

Valdes-Leal, **JUAN DE** (1630-91). Spanish painter. Born at Seville or Córdoba, he studied probably under the



Juan de Valdes-Leal, Spanish painter

elder Herrera. In 1658 he went to Seville, and in 1663 became president of the new academy founded by Murillo. Valdes practised sculpture, engraving, and architecture with indifferent success. His art is tinged with pessimism and lacks serenity. In the museum at Seville is a series of scenes by him from the Life of S. Ignatius. He died at Seville, Oct. 14, 1691.

Val de Travers. Valley of Switzerland, in the canton of Neuchâtel. It lies in the Jura Mts., is traversed by the rly. from Neu-

the mouth at Corral or Valdivia port, a fine harbour, and is connected by a branch with the Longitudinal Rly. There are tanneries, shipbuilding yards, breweries, soap and candle factories. Wheat, hides, wool, and whale oil are exported. It is famous for its surrounding resorts, with woods, lakes, and beaches. Pop. 49,481.

Valdivia, **PEDRO DE** (c. 1498-1554). Spanish soldier. Born near La Serena, Estremadura, he served in Italy, and about 1534 went to the New World, being of great assistance to Pizarro in Peru. He was then sent to conquer Chile, where in 1541 he founded Santiago, and for six years fought against the natives. After fighting again in Peru, he returned to Chile, and during a revolt was killed by the Indians.

Vale. Name applied to a type of valley common in the lowlands of England. Usually it is a wide level-floored valley between hill ridges, with a scarp on one side and a gentle slope on the other. The vale



Pedro de Valdivia, Spanish soldier



Valence, France. The Romanesque cathedral of S. Apollinaire

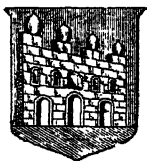
of Religion, and was restored in 1609, with additions in 1861. The Romanesque chapel called *Le Pendentif* was built for the Mistral family in 1548. Valence, known to the Romans as *Valentia*, was long under the suzerainty of its bishops, but put itself under the protection of Louis XI. It was a noted centre of Protestantism. During the Second Great War Valence was liberated with little opposition from the Germans by the U.S. 7th army Aug. 31, 1944.

Valencia. Former kingdom in E. Spain. Lying on the Mediterranean coast, between Aragon, N., and Murcia, S., it comprised the

area now divided into the provs. of Valencia, Alicante, and Castellón de la Plana. It came into existence at the downfall of the caliphate of Córdoba, and was a Muslim kingdom from 1021 until 1094, when it fell into the power of the Almoravides (*q.v.*). Early in 1095 the Cid Campeador besieged and took the city; but the Moors resumed possession in 1101, and remained there until the conquest by James I of Aragon, 1238. On the marriage of Ferdinand and Isabella in 1469, the kingdom was incorporated in that of Castile. See Aragon; Castile; Spain.

Valencia. Prov. of Spain. On the S.E. Mediterranean coast, it lies between Castellón and Alicante. It is crossed by the Sierra Martés, and is drained by the Júcar, Guadalaviar, and their affluents. Its vegas or cultivated plains, and huertas or irrigated gardens, form one of the most productive dists. in Europe, and yield abundance of rice, citrus fruits, wine, and olive oil. Sheep and goats are reared on the highlands. Manufactures are mainly confined to the capital, Valencia, and to towns such as Alcira, Requena, Cullera, Liria. Area 4,239 sq. m. Pop. 1,419,184. See Spain.

Valencia. Third city of Spain, capital of the prov. of the same name, and a Mediterranean port.

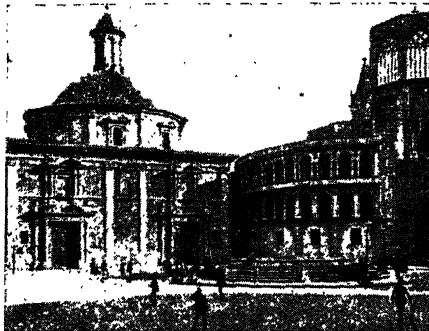


Valencia arm:

It is 2½ m. from the mouth of the Guadalaviar, 185 m. E.S.E. of Madrid. Its outport, El Grao, at the mouth of the river, is one of the best harbours of the E. coast of

Spain. Valencia lies within a huerta, a vast irrigated shady orchard with fine groves of orange, citron, and mulberry trees. Formerly capital of a kingdom, it is probably the most Moorish-looking city in Spain. Pop. 562,967.

The cathedral of Our Lady, with a fine octagonal tower, El Miguelete, was begun in 1262 on the site of a Roman temple. It was for a time a mosque, and its structure was not completed until 1482. In front of its Puerta de los Apóstoles meets weekly the water court, the oldest tribunal in Spain, which controls the supplies of irrigation water. The churches of San Andrés and Corpus Christi are adorned with fine frescoes and paintings. The provincial museum of paintings occupies the former Convento del Carmen. The silk



Valencia, Spain. Left, archiepiscopal palace, containing a famous library. Right, cathedral of Our Lady, built on the site of a Roman temple

exchange, La Lonja de la Seda, erected on the site of the Moorish Alcázar, is a glorious Gothic edifice, which is the heart of the city's commerce. A custom house erected by Charles IV is now a tobacco factory. The bull ring, Plaza de Toros, is reputed the finest in Spain.

The finest public squares are the Plazas del Mercado, de Tetuán, del Príncipe Alfonso, and de la Reina. Ancient walls have been replaced by boulevards, but the watch towers, Torres de Serranos and Torres de Cuarte, are of interest as extant specimens of medieval fortifications. The university, founded in 1411 by the union of two earlier educational foundations, was at its height in the 16th century; it has regained its earlier importance since the reorganization of 1848-58. According to tradition the first printing press in Spain was established in Valencia in 1474.

Rice, citrus fruits, wines, silks, olive oil, and dried fruits are the main exports. Tobacco, silks, linens, hempen goods, velvets and plush, fans, leather goods, glazed pottery and bricks (azulejos), and iron and bronze articles are manufactured.

In 138 B.C. the city gained the Jus Latinum. Taken by the Visigoths in 413, and by the Moors in 714, it became the capital of the independent Moorish kingdom in 1021. The Moors regained control after its capture by the Cid in 1095 until its final conquest by James I of Aragon in 1238. During the Spanish Civil War Valencia was the seat of government after the evacuation of Madrid, Nov. 7, 1936. On Oct. 30, 1937, the government was transferred to Barcelona. See Spain.

Valencia OR TACARIGUA. Lake of N. Venezuela. It lies between the state of Carabobo and Aragua.

Of the two W. outlets, the Trincheras communicates with the Caribbean Sea by the Agua Caliente. The lake is 22 m. long, 6 m. wide, and has a greatest depth of 300 ft.

Valencia. Town of Venezuela, capital of the state of Carabobo. It stands on the Cabriales river, 24 m. by rly. S. of Puerto Cabello, near the W. end of Lake Valencia. It has a fine early 19th century cathedral, a university, and hand-

some plazas. One of the chief manufacturing places in Venezuela, it exports coffee, sugar, cacao, and hides. Valencia was founded in 1555, and here Bolívar fought battles in 1814 and in 1821; by his second victory he freed Venezuela from Spain. The place suffered severely during an earthquake in 1812. Pop. 49,963.

Valencia de Alcántara. A frontier town of W. Spain, in the prov. of Cáceres. It is the last Spanish station of the rly. from Madrid to Lisbon. Agricultural produce and phosphates are the chief articles of trade. Pop. 13,500.

Valenciennes. Town of France in the dept. of Nord. It lies on the Escaut, here joined by the Rhônelle, 20 m. by rly. E. of Douai, and is a rly. junction. The chief industries are in cambric, iron foundries, metal working, and rly. materials, and there is commerce in sugar and coal. Valenciennes lace, for which it was once famous, is no longer manufactured here. The 17th century hôtel de ville with its fine façade was burnt in 1940. The chief churches are Notre Dame de S. Cordon, 1850-64, and S. Géry, founded 1225, with modern restorations and tower. The 16th century Jesuit college is now a lycée. In the museum is a collection of Flemish paintings and tapestries. Pop. 38,684.

After having independent status Valenciennes was merged in the co. of Hainault, but passed to France by the treaty of Nijmegen in 1678, and from then until the Revolution was the capital of French Hainault. Occupied by the Germans during the First Great War, it was retaken by Canadian troops, Nov. 4, 1918. The metal factories were robbed of much plant. Baldwin of Flanders, Froissart, and Watteau were born here.

Valenciennes. Variety of pillow lace. Originally made by hand at Valenciennes, it was later manufactured by machine at Nottingham. In the 18th century, the manufacture by hand was at its peak, and the craft employed about 4,000 workers in Valenciennes in 1750, but in 1851 only two lace-makers survived. The meshes, made of two threads partly twisted at the top, form irregular hexagons. *See* Lace plate.

Valency (Lat. *valēre*, to have force). Maximum combining power of a chemical element. The valency is expressed in relation to the number of hydrogen atoms with which one atom of another element can combine. For example, chlorine, bromine, and iodine combine with or can replace one atom of hydrogen, these elements being called univalent or monads. When an element such as oxygen combines with two atoms of hydrogen it is termed bivalent or dyad, when with three atoms (*e.g.* nitrogen), trivalent or triad, and with four (*e.g.* carbon), quadrivalent or tetrad.

Other elements show higher valencies, the terms used being quivalent or pentad, sexivalent or hexad, septivalent or heptad, and octavalent or octad. Where an element such as argon does not combine with another element it is said to be non-valent. The valency of the elements has been ascertained by experiment.

Valencies are indicated in what are known as graphic symbols by bonds, *e.g.* hydrogen chloride (hydrochloric acid) is shown as H-Cl. There is, however, the difficulty that some elements do not exhibit a constant valency. Phosphorus, for instance, combines with chlorine in two proportions, one containing three atoms of chlorine (PCl₃), and the other five (PCl₅). To explain this it is suggested that there are differences in the condition of the atoms.

Three chief types of linkage are recognized: (1) Covalency bonds, involving the sharing of a pair of electrons, one from each atom; this type of bond is exemplified by organic compounds which are non-ionisable. (2) Electrovalency bonds, where electrons are transferred from one atom to the other, that losing an electron becoming a positive ion and the other a negative ion; this type of bond gives some explanation of electrolytes. (3) Coordinated bonds, where a pair of electrons is shared but both are provided by the same atom.

Valens, FLAVIUS (c. 328-378). Roman emperor of the East, 364-378. He was the younger brother of Valentinian I



Flavius Valens,
Roman emperor
From a coin

(*q.v.*), who associated Valens with him in the government, assigning to him the Eastern provinces. His reign was marked by fighting with the Persians and with the Goths, the latter of whom, pressed by the Huns on the E., menaced the N.E. frontier of the empire. Valens, having become sole emperor on Valentinian's death in 375, let them settle in Thrace, but at the disastrous battle of Adrianople, Aug. 9, 378, the Roman arms were completely defeated, and Valens disappeared. During his reign the Arian controversy raged fiercely. The emperor himself was a supporter of the Arians and persecuted orthodox Christians.

Valentia. Island of co. Kerry, Eire. Lying 3 m. S.W. of Cahirciveen, it is 7 m. in length and 3½ m. in breadth, only about half being cultivated. It is separated from the mainland by Valentia Harbour, which is landlocked. There are Protestant and R.C. churches and schools on the island, the inhabitants of which are mostly sailors and fishermen. Valentia was selected as the E. terminus of the Anglo-American Telegraph co.'s Atlantic cable service. Pop. est. 1,500.

Valentian. In geology the lowest division of the Silurian system in Great Britain. It is named after the old Roman province of Valentia in S. Scotland, where strata of this age occur. The term is synonymous with Llandovery. *See* Silurian.

Valentine (Lat. *Valentinus*). Name of several saints. Two of them, a priest and a bishop, are said to have been martyred near Rome on the same day, Feb. 14, about 270. The practice of sending love tokens on their festival, Feb. 14, seems to have been a survival of the Roman custom of boys drawing the names of girls by lot in honour of Juno Februialis at the Lupercalia (*q.v.*) about the same date. In Great Britain the custom declined during the 19th cent., the decorative tokens of affection becoming gradually vulgarised.

Valentine. One of the Two Gentlemen of Verona in Shakespeare's play of that name. He

is in love with Silvia. A minor character in Shakespeare's Twelfth Night is also called Valentine.

Valentinian I (321-375). Roman emperor of the West, 364-375, whose full name was Flavius Gratianus Valentinianus. Born at Cibalís in Pannonia, he rose to high rank in the army, and on his election by the troops as emperor after the death of Jovian he associated his brother Valens (*q.v.*) with himself in the government of the empire. The rebellion of Procopius was crushed in 366. There was fighting against the Alamanni on the Rhine frontier, which kept Valentinian in Gaul for a great part of his reign. He was a ruler of considerable ability, and endeavoured to alleviate the condition of his subjects now grievously burdened by taxation. A Catholic Christian, he tolerated Arianism and all forms of religion. He was prone, however, to ungovernable fits of passion, in one of which he burst a blood-vessel and died, Nov. 17, 375.

Valentinian II (371-392). Roman emperor of the West, 375-392. A mere child, he became joint emperor with his half-brother Gratian after whose death in 383 his mother, Justina, was virtual ruler of the empire. With the advance of Maximus, whose claims as an independent sovereign had been recognized beyond the Alps, Valentinian took refuge with his brother-in-law, Theodosius, who defeated Maximus and restored Valentinian. An uneventful reign ended with his assassination by one of his generals, Arbogast the Frank, May 16, 392.

Valentinian III (419-455). Roman emperor of the West, 425-455. Son of Constantius and Placidia, daughter of Theodosius, he succeeded Honorius, his mother acting as regent. In his reign the Vandals, and Huns, who had invaded Italy, were checked by Aetius, but this general in 454 was treacherously put to death by Valentinian, who a year later shared the same fate at the hands of Petronius Maximus.

Valentinians. Sect of Gnostics. They were named after Valentinus, a priest of Alexandria, who was excommunicated in Rome, acquired a reputation as a philosophical theologian, and died in Cyprus about 160. He was one of the first to attempt the formation of a syncretistic theosophy by amalgamating Judaism and Christianity with the theogonies and philosophy of ancient Greece and the Orient. Only a few of his writings are

preserved, what is known of him being gathered from the works of Irenaeus, Hippolytus, Tertullian, and Clement of Alexandria. See Gnosticism; consult also Bampton Lectures, E. Burton, 1828.

Valentino, RUDOLPH (1895-1926). Italian-born American film actor. He was born at Castellaneta,



Rudolph Valentino,
Italian-born
American film actor

May 6, 1895, his real name being Rudolph Alphonso Guglielmi di Valentino d'Antongiuella. He went to the U.S.A. in 1913, intending to take up farming, but soon went on the stage as a dancer, appearing in London as partner to Gaby Deslys. "Discovered" by Rex Ingram, he made his screen debut in 1922 in *The Four Horsemen of the Apocalypse*, and soon acquired by his grace and virility an unparalleled reputation in highly romantic parts, e.g. in *The Sheik*, *Blood and Sand*, and *Monsieur Beaucaire*, this last, 1924, being considered his finest performance. Dying suddenly in New York, Aug. 23, 1926, his funeral was attended by hundreds of thousands. For a time his memory became something of a cult among numerous women filmgoers. Valentino published in 1923 a book of poems, *Daydreams*. Biographies by his second wife, Natacha Rambova, and S. G. Ullman, appeared in 1927.

Valenza. City of Italy, in the Piedmontese prov. of Alessandria. Situated on the river Po, 9 m. by rly. N. of Alessandria, it has a 16th century cathedral and some trade in silk.

Valera y Alcalá Galiano, JUAN (1824-1905). Spanish novelist and diplomatist. Born at Cabra in Andalusia, Oct. 18, 1824, and educated at Granada university, he entered the diplomatic service in 1847. A prominent publicist, he was in 1868 director of public education. Between 1881 and 1895 he represented Spain in Lisbon, Washington, Brussels, and Vienna. He died April 18, 1905.

A volume of poems, 1856, was followed by *Critical Studies of Literature*, 1864, but Valera's first novel, *Pepita Jiménez*, did not appear until 1874 (Eng. trans. by M. J. Serrano, 1891). It is regarded as a classic, and was followed by *The Illusions of Dr. Faustino*, 1875; *Knight Commander Mendoza*, 1877; *Dofia Luz*, 1879; a volume of short stories,

1887; and other novels, including *Juanita la Larga*, 1896, a study of Andalusian peasant life.

Valerian OR **ALL-HEAL** (*Valeriana officinalis*). Perennial fetid herb of the family Valerianaceae. It is a native of Europe and Asia. The leaves are deeply cut into two rows of lance-shaped segments. The stem, 3-5 ft. in height, terminates in many clusters of the small, pale pink, funnel-shaped flowers. The rootstock is used in medicine as an antispasmodic. In drying it develops the fetid odour which is attractive alike to cats and rats.

Spur valerian (*Kentranthus ruber*) is a perennial herb of the family Valerianaceae, native of Europe, W. Asia, and N. Africa. The lower part of the stem is woody, and from it erect, round, hollow branches are produced, with opposite lance-shaped, thick, grey-green, undivided leaves. The small crimson, tubular flowers differ from those of valerian chiefly in having a long spur.

Valerian (c. 190-286). Roman emperor, 253-260. His full name was Publius Licinius Valerianus. A leading senator, and censor in 251, he was sent by the emperor Gallus against the upstart emperor Aemilianus on the Danube, but both Gallus and Aemilianus were murdered, and Valerian, who had been proclaimed emperor in Rhaetia, was acknowledged by the senate. He issued edicts against the Christians and persecution and martyrdoms followed. A good soldier and administrator, he deputed his son Gallienus to rule the west and, after defeating the Goths in 257, he recovered Antioch from the invading Persians, and pursued their king Shapur I to the Euphrates. Valerian was captured near Edessa, 260, and lived the rest of his life in ignominious captivity.

Valerianaceae. A family of herbs and a few shrubs. Natives chiefly of the N. temperate zone,



Valerian. Leaves
and flower clusters



Valerian,
Roman emperor
From a coin

they have opposite leaves, and small, mostly irregular, tubular flowers in cymes or solitary. The fruits are small, dry, and one-seeded. Their medicinal properties as antispasmodics have been known since ancient days. See Spikenard; Valerian.

Valeric Acid. One of the fatty acids. It occurs in four isomeric modifications, viz. (1) normal valeric acid or propylacetic acid, obtained by heating normal butyl cyanide with potash; (2) inactive valeric acid or isopropylacetic acid, found naturally in valerian root (*Valeriana officinalis*) or prepared by oxidising amyl alcohol; (3) methyl ethyl acetic acid; and (4) trimethyl acetic acid. Inactive valeric acid forms salts known as valerates, those of ammonium and zinc being employed in medicine. Both the acid and its salts have a distinctive smell resembling that of old cheese.

Valerius Flaccus, GAIUS. Roman poet. Little is known of him, except that he was one of the *Quindecimviri sacris faciundis* at Rome, 15 officials to whom the keeping of the Sibylline books was entrusted, and that he died young, about A.D. 90. He was the author of *Argonautica*, an account of the voyage of the Argonauts, in eight books, dedicated to the emperor Vespasian.

Valéry, PAUL (1871-1945). A French poet. He was born at Cette, Oct. 30, 1871, and educated at Montpellier university. In 1891 he went to Paris, where he met Mallarmé. Some of his early verse attracted little attention, and for nearly 20 years he ceased to write. The appearance in 1917 of *La Jeune Parque*, a long poem, gained him a large public; other volumes followed, as well as a collection of essays in 5 vols. under the title *Variété*. In 1925 he became a member of the academy, and in 1937 professor of poetry at the Collège de France. A metaphysical poet, too abstruse for the general reader, Valéry nevertheless enjoyed a great reputation. He died July 20, 1945.

Valetta. Alternative spelling for the capital of Malta, entered in this work as Valletta.

Valette, JEAN PARISOT DE LA (1498-1568). French grand master of knights of S. John of Jerusalem. A native of Toulouse, he entered the order



Jean de la Valette,
Grand Master

as a young man, becoming grand master in 1537. His naval operations against the Turks led to their investment of Malta with a fleet of 150 vessels. Valette, with a force of 9,000 men, kept them at bay for five months, and when the Muslims raised the siege and withdrew, their losses amounted to over 20,000 men. Valette died Aug. 15, 1568. The name is sometimes spelled Vallette. *See* Malta.

Valga (Russ., Valk; Ger. Walk). Town of Estonia S.S.R., capital of a dist. of the same name. It lies near the Latvian frontier on the right bank of the Peddel, an affluent of the Embach, 125 m. S.E. of Tallinn, and is an important junction on the Riga-Tallinn, Riga-Pskov main rlys. Founded as Peddel in 1334 by the knights of Livonia, it was several times destroyed during the wars between Sweden and Poland, and was burned by the Russians in 1702. It has a distillery and a brewery, and trade in flax, linseed, grain, wax, and other agricultural products. During the Second Great War Valga, overrun by the Germans during July, 1941, was recaptured by Gen. Bagramyan's 1st Baltic army Sept. 19, 1944. Pop. 10,000.

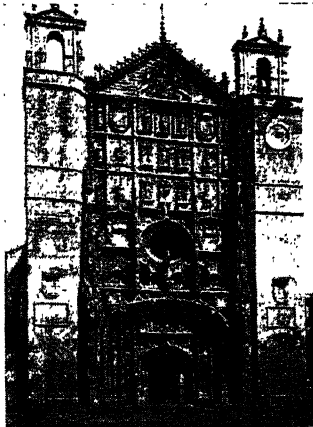
Valhalla (Old Norse *valhöll*, hall of the slain). In Norse mythology, Odin's hall in Asgard on the top of Bifröst (*q.v.*). It was thatched with shields, hung with mailcoats, and lit with swords, and had 540 doors through each of which 800 champions marched to the last fight. In Valhalla Odin received dead warriors, who there refought their battles by day and feasted by night. (*See* Odin.) The name was also given to the hall of fame commemorating eminent Germans, near Regensburg, on the N. bank of the Danube. It was built 1830-42 by King Louis I of Bavaria, and contained over 100 busts of distinguished Germans.

Valk. Russian name for the Estonian town Valga (*v.s.*).

Valkyrie (Old Norse *valkyrja*, chooser of the slain). In Norse mythology, name for Odin's warrior maids, half human and half unearthly, who rode to battle over sea and through the air to choose the slain for Valhalla. They belong to the Viking age. The names are recorded of thirteen who lived in Vingolf, part of Valhalla, and carried the mead round at Odin's feasts.

Valkyrie, *THE* (*Die Walküre*). Opera by Wagner. The second of the four works comprising *Der Ring des Nibelungen*, it was

completed in 1854, but not produced until Aug. 16, 1876, at Munich, being given at Baireuth the same year. The first London performance was at Her Majesty's, 1882, and the first English version at Covent Garden, 1895. This work, with its Ride of the Valkyries, introduces Brunhild (*q.v.*).



Valkyrie.

Name of three British yachts. Owned by Lord Dunraven, they were prominent in connexion with his attempts to win the America Cup, 1893-95. Valkyrie I competed in 1893, being beaten by Vigilant. In 1894 she was sunk in the Firth of Clyde after colliding with another vessel. Valkyrie II and III competed unsuccessfully in 1894 and 1895 respectively. *See* America Cup; Yachting.

Valla, LORENZO OR LAURENTIO (c. 1400-57). Italian scholar. He was born in Rome, became professor of eloquence at Pavia in 1431, and opened a school of eloquence in Naples, where he died Aug. 1, 1457. Writer of many works of history, criticism, dialectics, and moral philosophy, he has been described as the father of modern negative criticism, owing to his exposure of a notable papal imposture in De Donatone Constantini. His *De Elegantis Linguae Latinae*, 1471, and translations of Herodotus and Thucydides, were his other best known works. *See* Donation of Constantine.

Valladolid. Prov. of Spain. It is adjacent to Palencia, León, Zamora, Salamanca, Avila, Segovia, and Burgos, and is well drained by the Douro and its affluents. The

N.W. is occupied by the Montes de Torozos, and the remainder is a fertile plain, yielding cereals and fruit in vast quantities. The forests on the mts. provide timber for numerous sawmills. Area, 3,155 sq. m. Pop. 354,331.

Valladolid. City of Spain, capital of the prov. of the same name. Situated on the left bank of the Pisuerga, 102 m. direct N.W. of Madrid, it is an important rly. junction connected with the capital. For a long period it was the capital of Castile and León, and later, until 1560, of Spain.

Beside the Plaza de Portugalete is the incomplete Renaissance cathedral, begun by Juan de Herrera in 1535; it contains paintings by Giordano. The most interesting church is the Gothic Santa Maria la Antigua (1088). Cardinal Torquemada remodelled in the 15th



Valladolid, Spain. The 17th century university building. Top, façade of the church of San Pablo

century the 13th century church of San Pablo, and the duke of Lerna reconstructed it two centuries later; herein the ancient Cortes met frequently. Like the Colegiata de San Gregorio, now municipal offices, it is one of the finest Gothic edifices in the world.

Valladolid university, dating from 1346, is now housed in a palace of the 17th century. It has six faculties and over 5,000 students. The ancient royal palace is now the seat of the provincial authorities. Philip II was born, Columbus died, and Cervantes lived in Valladolid. Church councils were held here in 1124, 1137, and 1322. The French sacked the city and destroyed many artistic treasures in 1808. There is considerable trade in agricultural products. Pop. 135,785.

Valladolid. Town of Mexico. In the state of Yucatan, it is 95 m. E.S.E. of Mérida. Founded in 1544, it has a Jesuit college and remains of a convent, and manufactures cotton.

Vallauris Ware. Porous red clay pottery produced at Vallauris, near Cannes, France. It is covered with an opaque olive-green glaze and decorated with flower overglaze. At Golfe Juan, at the foot of the village, art pottery of a high order is made.

Valle d'Aosta (Fr. Vald'Aosta). Autonomous region and prov. of Italy, formerly included in Piedmont. It lies in the extreme N.W. of Italy, next to the French and Swiss frontiers. Most of the people are French speaking, in spite of efforts to Italianise them. In 1945, France claimed the area; but when Italy agreed to give the valley local autonomy, and recognized French as on an equality with Italian, France abandoned the claim. Area 1,260 sq. m. Pop. 84,000.

Valletta or **VALETTE**. Capital of Malta. On a promontory on the N.E. coast of the island, it has a



Valletta arms

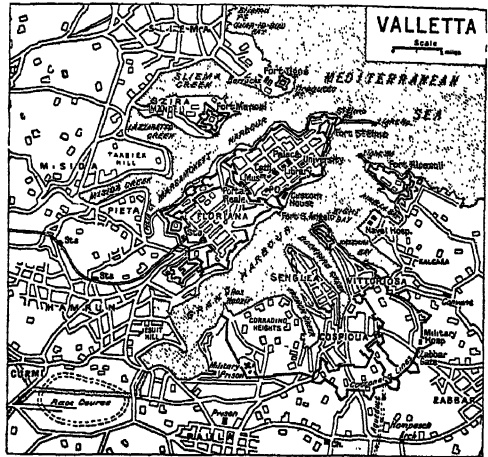
commodious harbour on each side, and the light-house and fort of St. Elmo at the extremity. Fortified, and the chief British naval and coaling station in the Mediterranean Sea, equipped with docks for naval and other vessels, it is one of the foremost ports of call in the world on the Suez route to the Orient. There is a rly. to Citta Vecchia, the old capital, about 8½ m. to the W.

The governor's residence (1573-77) was formerly the palace of the Knights of St. John. Other notable buildings were the palaces of the Maltese nobility, the university, library, and museum. The city was named after Jean Parisot de la Valette, who defended it against the Turks in 1565. It was heavily damaged during the Second Great

War. A substantial part of the £30,000,000 grants for reconstruction made by the U.K. govt. to Malta from 1942 was devoted to Valletta. A bronze tablet on the wall of the palace commemorates a visit by F. D. Roosevelt, Dec. 8, 1943, and his expression of U.S. admiration for Malta. See *Malta* ill. p. 5449; Malta in the Second Great War; Malta, Knights of; Vallette, J. P. de la.

Valley. Low-lying strip of ground bounded on either side by higher land. Most valleys have been carved out by erosion, being worn down by water or ice action, the intervening high ground being largely residual. Rift valleys (*q.v.*) due to faulting, and valleys resulting from down-folding of the earth's crust, are exceptions. Erosion naturally favours bands of soft-rocks, or zones of shattering in the earth's crust. Valleys therefore often mark such features *e.g.* the low ground below the chalk ridges of the N. and S. Downs eroded in the soft Gault Clay bed, and the Great Glen of Scotland carved along the line of a major zone of fracture.

Valleys in early stages of development are narrow gorges with irregular longitudinal profiles. They develop into evenly graded features in which the floor becomes smoother and wider until a broad flood-plain of alluvium flanked by gently rising bluffs is established.



Valletta. Plan of the town and harbour of this British Mediterranean naval port

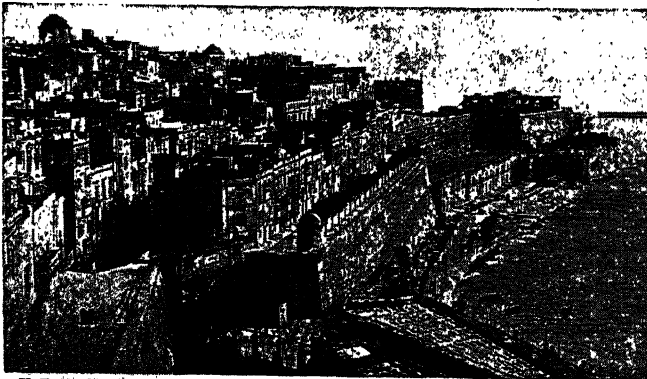
The sides of such valleys have a V-shaped cross-section and are the result of water erosion. U-shaped or trough-like valleys are formed by valley glaciers scraping away the valley floor and lower slopes of the sides. These valleys often have precipitous walls over which the tributary streams cataract. Drowned valleys are the result of encroachment of the sea upon the lower reaches of rivers. The estuary so formed has a very irregular shape owing to the flooding of the main valley and its tribes. Many important harbours are drowned valleys, *e.g.* Plymouth, Sydney, Hong Kong.

Valleys are usually more densely populated than the neighbouring higher ground. They control the great routes of land traffic, *e.g.* the Rhône-Rhine, Vardar-Morava, Hudson-Mohawk routes. Even when the rivers are not navigable roads and rlys. use the valleys.

VALLEY BREEZE. This is a term applied to the breeze which may blow up a valley or a mt. slope during the day, when the ground is warmed by the sun. The air, heated in turn, becomes less dense and rises, producing the upward flow. A valley breeze is the reverse to the katabatic wind. See *Katabatic*; *Mountain*; *Rift Valley*.

Valleyfield or **SALABERRY DE VALLEYFIELD**. Town of Quebec, Canada. It is near the head of Beauharnois Canal, and is served by the C.N.R. and St. Lawrence and Adirondack rly. It has textile factories, paper and flour mills. Pop. 17,052.

Valley Forge. Village of Pennsylvania, U.S.A. It stands on the Schuylkill river, 20 m. N.W. of Philadelphia. In its neighbourhood



Valletta, Malta. View of part of the town looking towards Fort St. Elmo, showing the water-front of the Grand Harbour

Washington and his army of 10,000 men passed the winter of 1777-78, suffering greatly from cold and want. The tract, of about 500 acres, is now a public park, containing relics of the camp and several memorials.

Vallombrosa. Pleasure resort of Italy. It is 21 m. due E. of Florence, in the prov. of that name, and stands amid the forests

Bournonville, the united French forces amounting to 50,000 men. The Prussians on Sept. 20 attacked Kellermann at Valmy, and were defeated. Though no more than a cannonade, this action is ranked by Creasey among the decisive battles of the world, for it saved the new-born French republic.

Valois. Name of a famous French family, members of which

were kings from 1328 to 1589. The name comes from Vez, a town in the dept. of the Oise, the dist. around which was called Valois. The co. of Valois became crown property under Philip Augustus. In 1285 it was given to Charles, son of Philip III, and a later Philip, the son of Charles, became king of France as Philip VI in 1328. He and his successors are therefore known as the Valois kings. The direct line ruled until 1498, when the branch of Orléans in the person of Louis XII succeeded. From 1515 the Angoulême branch reigned, and the extinction of the royal house of Valois came with the death of Henry III in 1589, when the

Bourbon kings began. The duchy of Valois, created in 1406, was held by various royal ladies before 1630, and from then to the Revolution was, with intervals, a possession of the dukes of Orléans. *See France.*

Valona. Italian form of the name of the Albanian town Vlonë (*q.v.*).

Valonia. Acorn cup of *Quercus aegilops*, the Turkish or Greek oak. It contains a high percentage of tannic acid, the Turkish valonia 32-36 p.c., and the Greek 26-30 p.c., and is extensively used in the preparation of leather, especially the higher grades. The name is derived from Vlonë.

Valparaiso. Fortified city and seaport of Chile, capital of the prov. of Valparaiso. The city, which is the principal seaport on the W. coast of S. America, stands on the Bay of Valparaiso, 116 m. by rly. W.N.W. of Santiago. The bay is sheltered on three sides, but is open to the N., and the town is built on the slopes of a range of hills about 1,500 ft. alt.

On the S. side of the bay is the finest thoroughfare in the town, the Avenida de las Delicias. The W. part of Valparaiso contains the port, where there are a large number of public buildings and warehouses bordering the docks and quays. Among the principal buildings are the custom house, government house, post office, city hall, exchange, prisons, hospitals, theatres, and police barracks. There are a natural history museum, a naval school, and other naval establishments. In the city are several fine squares adorned with monuments of Columbus, Arturo Prat, Admiral Cochrane (who founded the Chilean navy), and other celebrities.

The industries include brewing, distilling, sugar refining, and

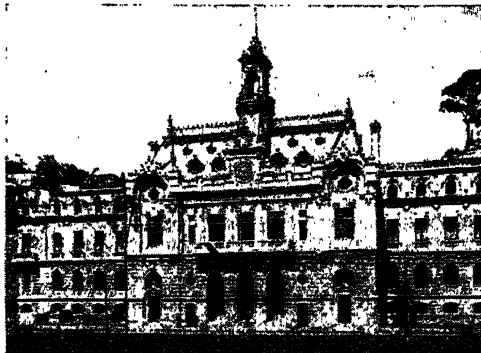


Vallombrosa, Italy. The historic Benedictine convent

of the Apennines, at an alt. of 3,140 ft., and is reached by a cable rly. Here, about 1030, was founded a Benedictine abbey, which was destroyed by the troops of Charles V in 1527. It was rebuilt, but was suppressed, and in 1870 the buildings were taken for a school of forestry. Here is a meteorological station founded in 1654. The "autumnal leaves that strow the brooks in Vallombrosa" are referred to in *Paradise Lost*.

Valls. Town of Spain, in the prov. of Tarragona. It is 11 m. by rly. N. of Tarragona city and 50 m. S.S.W. of Barcelona, and stands in a fertile plain, from which rise its well-preserved walls and towers. There are textile factories, paper mills, distilleries, and tanneries. Here in 1809 the Spaniards were defeated by the French. Pop. 14,700.

Valmy. Village of France. In the dept. of Marne, it is 6 m. W. of Ste. Meneshould, on the main road to Châlons, and was the scene of an action between the French and the Prussians, Sept. 20, 1792. The latter had entered French territory on Aug. 12, and were first opposed by Dumouriez, who was afterwards joined at Ste. Meneshould by Kellermann and



Valparaiso, Chile. The waterfront; because of the narrow beach, small boats are hoisted on to the roadway, as seen here, to avoid damage by heavy seas. Upper picture, the City Hall in the Plaza del Castillo

coach-building, and there are foundries, machine shops, and government rly. sheds. Valparaíso is a port of call for several steamship lines, and there is rly. communication with Buenos Aires through a tunnel in the Andes, and daily air service.

Founded in 1536 by Juan de Saavedra, Valparaíso was captured by Drake in 1578 and by Hawkins in 1596. In 1600 it was pillaged by the Dutch, and was greatly damaged by the Spaniards who bombarded the town in 1866. It suffered during the revolt of 1891, and has experienced severe earthquakes. Pop. 215,614.

Valse. French form of the name of the originally German dance, the waltz (*q.v.*).

Vals-les-Bains. Town of France. In the dept. of Ardèche, it is situated in the valley of the Volane, in a volcanic dist., 12 m. W.S.W. of Privas. It is a health resort, noted for its many mineral springs, known since the 17th cent. and resorted to by persons with gastric affections, diabetes, etc. Pop. est. 4,500.

Valtellina. Upper valley of the river Adda, N. Italy. It stretches E. from Lake Como for about 55 m. towards the Stelvio Pass, which is reached by a high road through the valley. The rly. runs to Tirano from Lake Como. The valley floor is fertile, and yields wheat, figs, mulberries, and a celebrated aromatic red wine. In the Middle Ages it formed part of Lombardy; became part of Grisons in 1512; the successful French expedition sent by Richelieu, 1624, which led to its annexation, was his first incursion into international politics. Later the valley was papal property; in 1814 it was Austrian, and in 1859 Italian.

Value (Fr. *valoir*, to be worth; from Lat. *valere*, to be strong). Word used in various contexts to denote worth, efficacy, significance, strength; e.g. the value of a house, a suggestion, a medicine, a vowel. In criticism of painting the term tone-value denotes the effect of light and atmosphere on objects, while colour-value denotes the inter-relation of various colours in a picture.

The notion of value as the basis of prices and exchange has been much considered by successive generations of economists. It is generally agreed that there are three kinds of value: subjective use value, the importance attached by an individual to a commodity; subjective exchange value, the ratio between subject-

ive use values in the mind of the person evolving them; and objective exchange value, the ratio in which persons actually exchange commodities. Ordinarily a buyer gives less than he would be prepared to give, and hence through exchange acquires a surplus of subjective use value. As money usually intervenes in practical exchanges, the prices at which goods are sold measure their objective exchange values in terms of money. A general rise of prices indicates that money has become relatively of less value than most commodities; and vice versa. There cannot be a rise in the exchange values of everything.

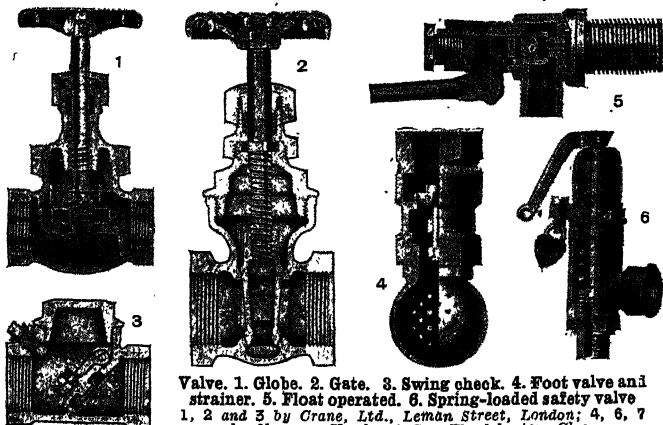
According to the labour theory of Adam Smith, Ricardo, and Mill, the value of a commodity depended on the labour—time, effort, ingenuity, skill, hardship, etc.—embodied in it. Marx believed that the value of a commodity depended on the socially necessary labour its production would require from time to time under changing methods of production. Neither of these theories adequately fitted the facts, for value arises not so much from any characteristics of the thing as from our attitude to it. Today the final utility or marginal utility theory of value, elaborated in the last quarter of the 19th century by Jevons, and later by Marshall, is generally held. This states that the subjective exchange value of a commodity measures the ratio between the importance an individual attaches at any time to an additional unit of the commodity and a unit of money. The subjective exchange values of different people constitute the demand for a commodity (*i.e.* the quantities that would be bought at various prices) and the supply of a commodity (*i.e.* the

quantities that would be offered for sale at different prices). Marshall likened demand and supply to the two blades of a pair of scissors, the price at any time being the cutting point.

A thing is said to have scarcity value when its desirableness and hence its market value arise principally through its relative rarity (*e.g.* particular postage stamps, works of art). Monopoly value attaches to any commodity the supply of which is controlled by one potential supplier, who, theoretically, aims at fixing the price at the level which will yield the maximum profit. The normal value of a commodity is the ideal towards which market values tend during a period within which known conditions of supply operate; the value that will maintain equilibrium between supply and demand. See Economics; Exchange; Price; Wealth.

Valuer. One who appraises for another property or estate, real or personal, generally land or houses for purposes of letting, selling, or mortgaging, for compensation for dilapidation, or compulsory acquisition, or assessing for taxes, rates, etc. A valuer is responsible for loss caused by his ignorance or negligence. See Appraiser.

Valve. Device to control flow of fluids through pipes and other conduits. Automatic valves operated by fluid pressure include pump and other check valves, relief, and pressure-reducing valves. Mechanically actuated valves, time-controlled independently of the fluid, are used in hydraulic and heat engines to govern the fluid flow. The gunmetal globe valve, Fig. 1, is the best-known type of manually operated valve. Fluid flows upwards through the opened seating port when the renewable

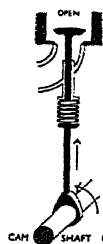


Valve. 1. Globe. 2. Gate. 3. Swing check. 4. Foot valve and strainer. 5. Float operated. 6. Spring-loaded safety valve. 1, 2 and 3 by Crane, Ltd., Leman Street, London; 4, 5, 6, 7 by Newman Hender & Co., Woodchester, Gloucs.

metal or other disk is raised by turning the screwed spindle. The domestic water tap is of similar design. The gate valve, Fig. 2, offers less resistance to flow in low pressure pipe lines. Large sizes, made partly of cast iron, used on water mains are known as sluice valves. Parallel slide valves for boiler blow-down are similar, but the gate has parallel sides. Oblique or Y valves, of a globe pattern with an oblique seating as in Fig. 3, seek to combine the best features of globe and gate valves. A simple automatic reflux valve, the clack valve of the rural water pump, is a weighted disk of leather or rubber, hinged at one side to a flat metal seating. The swing check valve, Fig. 3, also admits of flow in only one direction, from right to left in the diagram. Other patterns have a horizontal seating closed by a guided mushroom disk, as with the pump suction foot-valve, Fig. 4, or by a ball which can be displaced by an upward flow of fluid. The rubber-sleeved valve of the pneumatic bicycle tire is another non-return valve: the spring-loaded valve of a car tire is similar, in principle, to Fig. 6, the pressure of air from the pump forcing the valve off the seating against the thrust of a spring. The ball valve, Fig. 5, shuts off a flow of water automatically when a ball float attached to the lever reaches a predetermined level, variable by the adjusting screw on the left. Safety or relief valves, Fig. 6, are used on such pressure vessels as boilers and compressed air receivers: other patterns have dead-weights or a weighted lever in place of a spring. The casing should be lock-fast, and fitted with easing gear for testing. The pressure-reducing valve, Fig. 7, automatically reduces fluid pressure. The double-beat valve, held open by the thrust of the adjustable spring, closes when the reduced pressure acting under the piston exceeds the spring pressure. In practice,



Valve. 7. Spring-loaded pressure-reducing valve - reducing valve thus controlled, adjusts the valve opening to maintain equilibrium. Steam traps are fluid-operated automatic valves designed to control discharge of condensed steam, and to prevent loss of useful steam. The mechanism may be actuated by the level within a casing, or by



Valve. 8. Tappet valve of internal combustion engine

immediately after firing, to exhaust spent gases. The positions of the tappet valves distinguish side-valve from overhead-valve engines. See Radio; Thermionic Valve.

Valve. In music, a piston applied to certain wind instruments, whereby the speaking length is increased, and consequently the range of available sounds extended. The same result can be partially secured by piercing the tube with holes which can be stopped by the fingers or by keys, but there are practical difficulties connected with the limited stretch of the fingers which led to the invention of valves, so that chromatic notes and free modulation could be made possible. Used separately, the first valve lowers the pitch by a tone, the second by a semitone, the third by a tone and a half, and the fourth by two tones and a half. See Cornet; Horn; etc.; and other wind instruments.

Vampire (Serbian *vampir*). Nocturnal demon of the folklore of Slavonic and other peoples. It is manifested in various forms, the most usual being that of the spirit of the recently dead, or a demon occupying the dead body, returning to suck the blood of the living. Examination of a body thus demonstrating its vampirism would reveal a fresh, ruddy colour and the suppleness of life. The ways of destroying the vampire were either to drive a stake through the body, or to decapitate and burn it. Bram Stoker's story, *Dracula*, 1897, later dramatised and filmed, is based on the legend.

Vampire. British fighter aircraft. Designed in 1942 by the De Havilland co., it first flew in 1944, and was the first aero-

temperature. The mushroom or tappet valves of an internal combustion engine, Fig. 8, are typical of many mechanically actuated valves, working in a definite time-relation to the firing of each cylinder. One cam opens the mixture (inlet) valve prior to compression and firing, and another opens the exhaust (outlet) valve immediately after firing, to exhaust spent gases. The positions of the tappet valves distinguish side-valve from overhead-valve engines. See Radio; Thermionic Valve.

plane to exceed 500 m.p.h. at operational altitudes. Powered by a single turbo-jet engine, the Vampire had a wing span of 40 ft. and an overall length of 30 ft. There were twin tail-carrying booms on either side of the engine and cockpit nacelle. The cockpit was armour-plated and pressurised, and armament consisted of four 20-mm. cannon mounted below the cockpit. The Mark 4 Vampire introduced in 1947 had an operational radius of 1,390 m. The Sea Vampire was the first jet-propelled aeroplane to land on and take off from an aircraft carrier at sea. Vampires were provided for the R.A.F. and many Commonwealth and foreign air forces. See Aeroplane illus., p. 130.

Vampire Bat. Name given to the members of a family of bats (*Desmodontidae*). Found in Central and S. America, they live by sucking the blood of animals. There are two genera, *Desmodus* and *Diphylla*, with one species each. Both the arrangement of their teeth and the structure of the stomach have been specialised for blood-sucking. By a bite with their sharp teeth these small bats remove a very thin slice of skin from their victim, and then suck the blood. These bats transmit



Vampire Bat. Blood-sucking bat of Central and South America

the virus of rabies and thus infect cattle. The large *Vampyrus* or *Phyllostoma spectrum* of Brazil, and several other bats, formerly thought to be blood suckers, are harmless.

Van. Dutch word meaning of. Used as a prefix to surnames, it is the equivalent of the French *de* and the German *von*. Dutch names, like French and German ones, are alphabetised in this Encyclopedia under the main word, not under the prefix (see Arvelde; Eyck, etc.). The few exceptions are those where British or American usage has made the van inseparable from the name proper, e.g. Van Buren, Van Dyck.

Van (abbrev. of caravan). Large covered wagon, or a carriage attached to a railway train for carrying luggage. The van is

usually a four-wheeled vehicle, either driven by motor or drawn by one or two horses, and is much used by tradesmen and others for carrying light goods. The word *van* (Fr. *avant-garde*) is used also for the front of an army or the foremost division of a fleet, and (from Lat. *vannus*, fan) for a fan for winnowing grain. See Caravan; Police.

Van. Lake of Asiatic Turkey. This sheet of salt water, without visible outlet, lies between the vilayets of Van and Bitlis. Its length is about 75 m. from E. to W., its width from N. to S. varying from 20 to 40 m. Its elevation is 5,200 ft.

Van. City of Asiatic Turkey. Standing on the E. shore of Lake Van, it is capital of the vilayet of the same name.

One of the chief places in Turkish Armenia, it manufactured cotton goods, and had a fair general trade. Itself ancient, it is built on the site of Thospia, the capital of the long-departed kingdom of Biaina. One of its interesting features is a hill, on the rock face of which are cuneiform inscriptions of the Urartu (Ararat) kings, who were strong enough to contend with the Assyrians. In the Middle Ages Van was the seat of independent Armenian princes. During 1895-96 it was the scene of Armenian massacres, and in the First Great War it suffered terribly, being taken and retaken by Turks and Russians. The vilayet of Van has a pop. of 126,919.

Vanadinite. Ore mineral of vanadium, and minor ore of lead. Its chemical composition is lead chlorovanadate $PbCl_2 \cdot 3Pb_3(VO_4)_2$. It occurs as reddish or yellowish prismatic crystals or crusts in the zone of oxidation of lead veins; and accompanies other vanadium-bearing minerals in some sediments.

Vanadium. One of the chemical elements. Its chemical symbol is V; atomic number, 23; atomic weight, 50.95; density 6.0 gm per c.c.; m.p. 1,720° C.; b.p. about 3,000° C. It has a body-centred cubic structure.

The metal was discovered by Del Rio in 1801 in a Mexican lead ore, but its true nature was not

realized until Sefström had rediscovered it in a Swedish iron ore in 1830. The name is derived from Vanadis, the Scandinavian goddess of love. It is thought to be more abundant than important metals like tin and lead. It is not found native, but is widely distributed as a vanadate or sometimes as silicate, sulphide, or oxide, in igneous and sedimentary rocks. Typical ores are vanadinite (*v.s.*), from which Del Rio first obtained vanadium compounds; and carnotite, a hydrated potassium uranyl vanadate $K_2 \cdot UO_2(VO_4)_2 \cdot 3H_2O$, which serves as an important source of radium, uranium, and vanadium. Both these ores are common in the U.S.A. and the former occurs also in Sweden and S.W. Africa and the latter also in



Van, Asiatic Turkey. The ancient city at the base of the Castle Rock, which has been a stronghold for 3,000 years

Australia. The world's greatest producer is Peru, where the element is found as a sulphide, patronite.

Many methods of extraction are used, these falling into two classes: acid methods, giving soluble vanadyl compounds, and alkali methods, giving soluble alkali vanadates. The vanadium is finally obtained as the oxide V_2O_5 , ferrous vanadate, or calcium vanadate, all of which are commercial materials. The production of pure vanadium is difficult and is best effected by reduction of the oxide with calcium in a bomb. There is little demand for metallic vanadium; it is mainly used as ferrovanadium. This used to be made from the oxide by the thermit process, but is now being prepared on an increasing scale in an electric furnace.

The metal is oxidised on heating in air and combines directly with chlorine, nitrogen, and carbon on being heated. It is not soluble in dilute sulphuric or in hydrochloric acid, but is soluble in nitric and concentrated sulphuric acids.

Aqueous alkalis have little effect, but fused alkalis convert it into water soluble vanadates.

Vanadium forms oxides corresponding to the valencies 2, 3, 4, and 5, each of which gives rise to a series of salts. Those formed from the lower oxides are powerful reducing agents, and the oxide V_2O_5 is amphoteric, yielding the vanadates. There are also formed vanadyl compounds which contain the radicals VO, e.g. vanadyl monochloride $VOCl$ or V_2O_3 , e.g. vanadyl sulphate $(VO)_2(SO_4)_3$. The main use of vanadium is in the preparation of special steels where its action is partly as a scavenger and partly as an alloying constituent. The element is added as ferrovanadium which is a more efficient scavenger than ferrosilicon or ferromanganese and owes its efficiency to the readiness with which it combines with oxygen, nitrogen, and carbon. The amount of ferrovanadium added is such as to give about 0.3 p.c. vanadium in the alloy. It is generally used in connection with other alloying elements, e.g. in chrome-vanadium steels. Its addition to steel imparts a fine grain structure and increases shock and vibration resistance. Of the vanadium compounds the oxide V_2O_5 is widely used as a catalyst in many oxidation processes. Other compounds have been used as mordants, insecticides, inks, for glass, and in medicine in the treatment of rheumatism and pulmonary tuberculosis.

Vanbrugh, DAME IRENE (1872-1949). British actress. Daughter of Prebendary R. H. Barnes, and sister of Violet Vanbrugh, she was born at Exeter, Dec. 2, 1872, and educated at Exeter and in Paris. She first appeared on the stage at the Theatre Royal, Margate, in 1888, as Phoebe in *As You Like It*, and made her London debut at the Globe that year in a revival of *Alice in Wonderland*. An actress of great charm, she excelled in comedy and created the parts of Gwendolen in *The Importance of Being Earnest*, 1895; Rose in *Trelawny of the Wells*, 1898; Lady Mary in *The Admirable Crichton*, 1902; later outstanding successes were in *Mr. Pim Passes By*, 1919; *The Truth About Blayds*, 1921; *Hamlet*,



Irene Vanbrugh, British actress

1930, in which she played the Queen; Viceroy Sarah, 1935; In Good King Charles's Golden Days, 1939; An Ideal Husband (revival), 1943. Irene Vanbrugh, who was created D.B.E., 1941, and was president of the R.A.D.A., married in 1901 Dion Boucicault (1859-1929). Her autobiography, *To Tell My Story*, was pub. 1948. She was acting until within a week of her death, Nov. 30, 1949.

Vanbrugh, Sir John (1664-1726). English dramatist and architect. Born



Sir John Vanbrugh,
English dramatist

in London, he studied architecture in France, became a captain in the army, and was arrested as a spy in France and imprisoned in the Bastille. He wrote ten comedies, as grossly indecent as other dramatic productions of the period, but undeniably witty and realistic. He was one of the dramatists attacked by Jeremy Collier. Best known of his plays are *The Relapse*, 1696; *The Provok'd Wife*, 1697; and *The*

Vanbrugh, Violet (1867-1942). British actress. Daughter of Prebendary R. H. Barnes, and

sister of Irene Vanbrugh, she was born at Exeter, June 11, 1867, and educated there and in France and Germany. She made her stage debut in a burlesque, *Faust and Loose*, at Toole's Theatre, London, 1886, and after touring with the Kendals in the U.S.A., went on as Anne Boleyn to Irving's Henry VIII at the Lyceum, 1891. She acted under the management of her husband, Arthur Bourchier (*q.v.*) at the Royalty Theatre, and was particularly successful in depicting society women.

The plays in which she gave memorable performances included *Glass Houses*, 1910; *The Young Person in Pink*, 1920; *Evensong*, 1932; *Muted Strings*, 1936. In her 74th year she appeared on the London stage with her sister in a shortened version of *The Merry*



Violet Vanbrugh,
British actress
Hugh Cecil

Wives of Windsor. She died Nov. 11, 1942.

Van Buren, Martin (1782-1862). American statesman. Born at Kinderhook, Dec. 5, 1782, of Dutch parentage, he became a lawyer, practising successfully at Hudson and later at Albany. During 1815-19 he was attorney-general of the state, and he was one of the powerful group that did much to fasten the spoils system on the country.

In 1821 he was elected to the U.S. senate, and in 1829 became governor of New York, being almost immediately made secretary of state by Andrew Jackson, whose election he had helped to secure. For a few months in 1831-32 he was minister to Great Britain, but in 1832 he was chosen vice-president. For four years he acted as Jackson's lieutenant, and in 1836 was elected to succeed him. He held office for one term only, as he was defeated in 1840, but remained a figure in public life, being at the end a supporter of Lincoln, until his death, July 24, 1862. *Consult* Life, E. M. Shepard, 1899.



Martin Van Buren,
American statesman

Vance, Alfred Glenville (c. 1838-88). A British comedian, known as the Great Vance. Born in London, his real name being Alfred Peck Stevens, he became a touring actor, and later opened a



Confederacy, 1705, which, contrary to the prevailing practice, introduced humble characters on the stage. In later years Vanbrugh rose to fame as an architect; his finest work is *Castle Howard*, and his largest and most grandiose mansion is *Blenheim Palace* (*q.v.*). He designed the *Haymarket Theatre*, 1705, and was its first lessee and manager. Knighted by George I in 1714, he was chosen controller of the royal works. He died March 26, 1726. A study by L. Whistler was published in 1938.

Vancouver. Map of the island off British Columbia, whose forests yield vast supplies of timber, while its coast-line supports a large fishing industry.

See following page

dancing school at Liverpool. He again toured as a character singer on the variety stage at the Metropolitan and South London music halls, where his humorous cockney songs, *e.g.* I'm a Chickalery Bloke, and later such rousing chorus songs as Act on the Square, Boys, became popular. He died Dec. 26, 1888.



Alfred Vance,
British comedian

Act on the Square, Boys, became popular. He died Dec. 26, 1888.

Vancouver. Canadian island in the Pacific Ocean, part of the province of British Columbia. Off the W. coast of British Columbia, it has an area of about 12,408 sq. m., and is 285 m. long by from 40 to 80 m. broad. It is separated from the U.S.A. by the Strait of Juan de Fuca, and from the mainland of British Columbia by Queen Charlotte Sound and the Strait of Georgia. The forested mountainous backbone of the island is a N. continuation of the Coast Range of the U.S.A.; its average height is 2,000 ft. to 3,000 ft., culminating in Victoria Peak in the N., 7,484 ft. Victoria, Alberni, and Esquimalt are ports; Nanaimo and Cumberland centres of coal mining. George Vancouver (d. 1798) circumnavigated the island in 1792, and the present capital, Victoria, was founded as a trading post by the Hudson Bay co. in 1843. Pop. 121,933.

Vancouver. City and seaport of British Columbia, Canada. It stands on a magnificent harbour on the southern side of Burrard

Inlet, on the mainland of British Columbia, 1,480 m. from Winnipeg. The buildings, nearly all erected since a fire in 1886, include the university of British Columbia. The chief industry is shipping, for which there are spacious docks, which can handle the whole Alberta wheat crop. From here vessels go to the Pacific ports and across to China, Japan, and Australia. Trans-Canada air lines link it with all parts of the N. American continent. It is also the terminus of the C.P. rly. and is served by the national system. The main C.P.R. line from Vancouver to St. John, New Brunswick, is 3,367 m. long. Other industries are sugar refineries, flour mills, saw mills, and shipbuilding. It is also a centre of the lumber industry and for general business. Pop. 273,353.

Vancouver, NORTH. City of British Columbia, Canada. It stands on Burrard Inlet, just opposite Vancouver city, with which it is connected by a ferry. It is surrounded by beautiful scenery, and this, with its position on the coast and facilities for shooting and fishing, make it a popular place for pleasure-seekers. Its industries include shipbuilding, quarrying, canning, and lumber mills. Pop. 12,500.

Vandals. Teutonic people of the E. Germanic stock. Although closely associated with the Goths (*q.v.*), they were, unlike them, destitute of the nobler barbarian qualities. Having moved from the shores of the Baltic to the middle Danube, they migrated westward. At the beginning of the 5th century they poured into

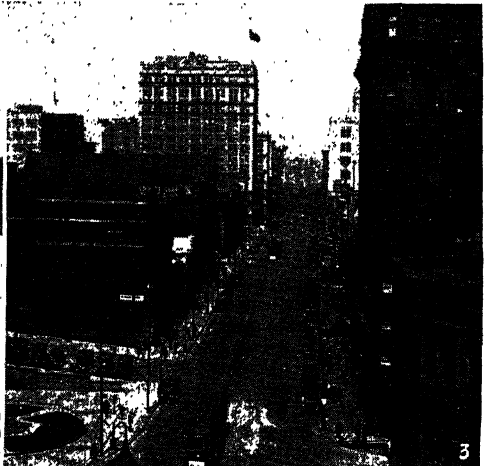
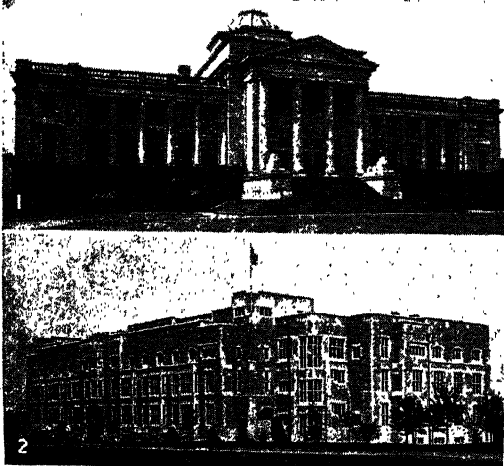
Gaul, and in 409 made their way into Spain. Thither they were soon followed by the Visigoths, who partly destroyed them, penning the survivors into the district which still bears their name in the form Andalusia. About 428 they left Spain for N. Africa. Upon the Mediterranean littoral they established a powerful dominion, and there they ruled for a hundred years.

Of their kings the most famous was Gaiseric (*q.v.*), who carried out the conquest between 429 and 439, and sacked Rome in 455. Their fanatical devotion to Arianism made them fierce persecutors of the Catholics. The pirate fleets of the Vandals spread terror over the whole Mediterranean, but in 533 the emperor Justinian, dispatched Belisarius (*q.v.*) to bring them to heel. He attacked them so vigorously that the Vandal race was blotted out.

Vandamme, DOMINIQUE RENÉ (1770-1830). French soldier. Born at Cassel, Nov. 5, 1770, he was by the age of 22 a brigadier-general in the revolutionary force. His greatest exploit was the reduction of Silesia in 1806-07. In 1813, after Dresden, he was defeated at Kulm and surrendered with 10,000 men. When, in 1815, Napoleon returned to France, Vandamme joined him and commanded a corps at Ligny. Exiled by the Bourbons until 1824, he died July 15, 1830.

Van de Graaff Machine. This apparatus is described under Electrostatic Machine.

Vandenberg, ARTHUR HENDRICK (b. 1884). American politician. Born March 22, 1884, at



Vancouver, British Columbia. 1. City Hall. 2. Arts building, University of British Columbia. 3. Hastings Street, one of the principal business thoroughfares of the city, looking west

Grand Rapids, Mich., he was educated at the university of Michigan law school, became a reporter, and rose to be editor and general manager of the Grand Rapids Herald. In 1928 he was appointed to fill a senate vacancy, and was re-elected 1934, 1940, and 1946.

An advocate of non-intervention before the Second Great War, he attacked the lease-lend bill, but after the Japanese attack on Pearl Harbour supported the administration. Roosevelt appointed Vandenberg delegate to the U.N. conference at San Francisco, 1945, and next year he was named temporary president of the senate. He favoured President Truman's foreign policy and the Marshall plan. Had Dewey won the presidential election of 1948, Vandenberg was regarded as his certain choice as secretary of state. He led the U.S. delegation to the U.N. in Paris after Marshall returned to the U.S.A. in Nov., 1948.

Vanderbilt, CORNELIUS (1794-1877). An American capitalist, familiarly known as "Commodore."



Cornelius Vanderbilt, American capitalist

Born at Staten Island, May 27, 1794, he began, as a lad of 16, a ferry to carry passengers and goods thence to New York, and in a few years was the owner of a large fleet of harbour craft, among which was the first steamboat to run between New York and New Brunswick, 1817. His interests were organized in 1824 into a company which, under his management, greatly developed. By 1867 he had obtained control of the New York Central and other rlys. Before his death he controlled a trunk line between New York and Chicago. He died Jan. 4, 1877, leaving a fortune of over £20,000,000. By his will the Vanderbilt university was founded in Nashville. *Consult* Life, A. D. Howden Smith, 1928.

Vanderbilt, WILLIAM HENRY (1821-85). American capitalist. Son of "Commodore" Cornelius, he was born in New Jersey, May 8, 1821. He became clerk in a New York bank in 1839, but took to farming in Staten Island. There he be-



W. H. Vanderbilt, American capitalist

came president of the Staten Island railroad, and made it such a success that he was taken into partnership by his father, on whose death in 1877 William became president of the New York Central and Hudson railroads. By untiring energy and unflinching business acumen, he obtained control of other important systems, and at his death, Dec. 8, 1885, was worth about £40,000,000. During his lifetime he made large donations to the Vanderbilt university.



W. K. Vanderbilt, American capitalist

W. H. Vanderbilt was succeeded in the business by three sons, Cornelius (1843-99), William Kissam (1849-1920), and George Washington (1862-1914). The eldest became vice-president of the New York Central and director of some 35 other rly. enterprises. He gave largely to philanthropic and religious causes. W. K.'s daughter, Consuelo, married in 1895 the 9th duke of Marlborough. Her brother, Harold Stirling Vanderbilt (b. 1884), railway magnate and bridge player, was also the yachtsman who in his Rainbow successfully defended the America Cup in 1934.

Van der Goes, Hugo (c. 1435-82). Flemish painter. Born probably at Ghent, where he joined the painters' guild in 1467, becoming dean in 1473, he took part in the decorations of Bruges on the occasion of the marriage of Charles the Bold and Margaret of York in 1468. In 1476 he retired to the monastery of Roodenclooster, near Brussels, where he continued to paint, and where he died. Concerned chiefly with historical, heraldic, or allegorical figures, Van der Goes won high approval for his study of the female. Brilliant colour and strong draughtsmanship make him one of the greatest early Flemish artists. There is doubt as to the authenticity of some works, even S. Vincent with a Canon (now at Glasgow). The Uffizi at Florence received a fine altar-piece; and the Death of the Blessed Virgin is at Bruges.

Van der Neer, ARTUS OR ARNOLD (c. 1604-77). Dutch painter. Born at Gorinchem, he worked at Amsterdam, where he kept a wine-shop. Of his life almost nothing is known. He painted landscapes with figures, often winter scenes of ice-skating, and a large number of views of towns, excelling

in moonlight effects. There are landscapes by him in the National Gallery and Wallace Collection, London. He died in poverty, Nov. 9, 1677.

Vandervelde, EMILE (1866-1938). Belgian politician. Born in a suburb of Brussels, Jan. 25, 1866, he studied law at the university there. He early joined the Socialist movement, was a conspicuous member of the International, and entered the Belgian chamber in 1894, soon becoming chairman of the Socialist group. In the First Great War he went into exile with the parliament, and represented his country at the peace conference in Paris, 1919. He was then minister of Justice, and during the period of the Locarno treaties he was minister of foreign affairs (1925-27). During 1936-37 he held the portfolio for public health. This prolific writer, made professor of political economy at Brussels in 1924, died Dec. 27, 1938.

Van der Waals, JOHANNES DIDERIK (1837-1923). Dutch physicist, born at Leyden, Nov. 23, 1837. A self-educated man, he taught physics in schools, and when 40 was appointed professor at Amsterdam, holding the post for 30 years. His special subject of study was the 'liquefaction of gases' (see Gas), and his discoveries included the existence of forces named after him, the Van der Waals Forces (v.v.). In 1910 he was awarded the Nobel prize for physics. Van der Waals died March 9, 1923.

Van der Waals Forces. Intermolecular forces. They are chiefly responsible for the deviations of the so-called permanent gases from the behaviour of "perfect" gases. The forces are very weak and arise from the mutual interaction and polarisability of the electron shells which enclose the molecules.

Van der Weyden, ROGER (1400-64). Flemish painter. Born at Tournai, he studied under his



Roger Van der Weyden, Flemish painter

father, a sculptor named de la Pasture. Apprenticed in 1427 to Robert Campin, he became in 1432 a master of S. Luke's guild, and worked at Tournai and Brussels, visiting Italy and Germany. His painting is ascetic in character; one may cite his Deposition, in the Escorial, Last Judgement, at

Beaune, and Mater Dolorosa and Ecce Homo, in the National Gallery, London. Leader of the Brabant school, he died in Brussels, June 18, 1464. See Charles illus. p. 1958.

Van de Velde, ADRIAN (1636-72). Dutch painter. Born at Amsterdam, Nov. 30, 1636, the son of Willem Van de Velde the elder, he studied under his father, and Wynants, Wouwerman, and Potter. He excelled in landscapes and coast scenes, with or without human figures or animals. There are many examples of his art in the Rijks Museum, Amsterdam, and he is well represented in the National Gallery, London. Some of his works were executed in collaboration with Ruysdael and Hobbema. He died at Amsterdam, Jan. 21, 1672.

Van de Velde, WILLEM (1633-1707). Dutch painter. Born at Amsterdam, Dec. 18, 1633, son of



W. Van de Velde,
Dutch painter
After Kneller

Willem Van de Velde the elder, he studied under his father and de Vlieger. At the invitation of Charles II he settled with his father at Greenwich about 1676, and established the highest

reputation as a painter of sea battles and other marine subjects. Many of his pictures are in England. He died at Greenwich, April 6, 1707. See Dutch School illus. p. 2879.

Van Diemen Gulf. Arm of the Timor Sea, on the N.W. coast of Northern Territory, Australia. It extends E. to W. for about 100 m., and is entered by Dundas and Clarence Straits on either side of the extensive Melville Island. The N. shore is Cobourg Peninsula.

Van Diemen's Land. Island off S.E. Australia, since 1856 called Tasmania (*q.v.*). Discovered by Tasman, 1642, it was named by him after Anton van Diemen (d. 1645), governor of the Netherlands E. Indies, who commissioned the expedition.

Van Dine, S. S. Pseudonym of Willard Huntington Wright, (1888-1939). American writer of crime stories. He created the character of Philo Vance, one of the earliest amateur detectives to follow the inductive method and show in his talk an amazing range of scholarship. Vance, with some aid from Inspector Markham, Sergeant Heath, and the narrator Van Dine, solved the Bishop, Canary, Greene,

and other fictitious murder cases in the 1920s; he was portrayed on the screen by William Powell. Wright himself was born at Charlottesville, Va., and educated at Harvard. Beginning a career as literary editor on the Los Angeles Times, 1907-13, he was literary, dramatic, art, and music critic to various magazines. In 1929 he was made a police commissioner in New Jersey. His death was announced April 13, 1939.

Van Druten, JOHN WILLIAM (b. 1901). British dramatist. Born in London, June 1, 1901, he was educated at London university, and became a solicitor, lecturing on law at the university of Wales, Aberystwyth, 1923-26. Early plays, *The Return Half*, 1924, and *Chance Acquaintance*, 1927, had moderate success, but with his study of adolescence, *Young Woodley*, 1928, he achieved fame. Later plays included *After All*, and *London Wall (q.v.)*. Van Druten went to the U.S.A. before the Second Great War, and for the New York stage wrote *Old Acquaintance*, 1940; *The Damask Cheek* (with Lloyd Morris), 1942; *The Voice of the Turtle*, 1943; *I Remember Mama* (adaptation), 1944. He published *Way to the Present*, an autobiography, 1938.



John Van Druten,
British dramatist

Van Dyck, SIR ANTHONY (1599-1641). Flemish painter. Born at Antwerp, Mar. 22, 1599, he studied under Hendrik van Balen, and in 1618 became a freeman of the guild of S. Luke. About then he entered Rubens's studio as an assistant, employed in copying that master's pictures for the engravers, making large cartoons from his sketches, and painting historical pieces on the Rubens model. Van Dyck had, however, embarked on portraiture with considerable success before his first visit to England in 1620. The artist returned to Antwerp in 1621, and the same year went to Genoa, thence to Rome, Mantua, Palermo, and Brescia, and back to Genoa, where he remained till 1627. After working at Antwerp and The Hague, he was induced by the offer of a pension to visit England, March, 1632, and was knighted, July.

During 1635-40 he was engaged upon his many portraits of the English court and its entourage.

His output was enormous; he is reputed to have painted Charles I 36 times. Handsome and agreeable in person, he lived, as he painted, magnificently and prodigally. The king married him to Mary Ruthven of Montrose in order to check, if possible, his dissipated habits. In 1640, Rubens having died, Van Dyck hurried to Antwerp in order to secure the patronage of the Spanish king. His demands, however, were too high, and he went on to Paris, only to find that his objective, the decoration of the Louvre, had been given to Poussin. He returned to London, seriously ill, died Dec. 9, 1641, and was buried in S. Paul's. His tomb was destroyed in the Great Fire of 1666.

Van Dyck's work may be roughly divided into four periods. Up to 1621 it shows the influence of Rubens, e.g. early self-portraits, and the Van der Geest in the National Gallery. Next comes the Italian period, which includes religious paintings and such portraits as the Balbi children in the National Gallery. The third period shows Rubens's influence once



Self-portrait in
the Uffizi Gallery,
Florence

more, in such works as *The Crucifixion*. The last and most prolific English period includes magnificent works in galleries and private collections of the U.K. Several portraits are at Windsor Castle.

As a portraitist Van Dyck excelled in the purity of his colouring, the character which he infused into his portraits, and, above all, the beauty with which he endowed hands. His influence on future English portrait painters was enormous, Reynolds in particular expressing admiration. For examples of his portraits, see Charles I; Falkland, 2nd Viscount; Hen-

rietta Maria; Rupert. As an etcher he has seldom been surpassed. Interest attaches also to the landscape sketches, in many ways foreshadowing the British water-colour school, in the possession of the British Museum. It is possible that only the rapidity with which he worked prevented his taking rank with the greatest painters of all time. There are studies by M. Rooses, 1902; E. Schaeffe, 1909.

Vane, Sir Henry (1589-1655). English politician. Son of a Kentish gentleman, he was born Feb.



Sir Henry Vane,
English politician

18, 1589, and educated at Brasenose College, Oxford. In 1611 he was knighted, and in 1614 entered the house of commons. He was soon an official of the royal household, and became one of the chief counsellors of Charles I. As secretary of state he had a hand in momentous events, being largely responsible for the condemnation of Strafford in 1641. He then became less devoted to Charles, and was dismissed, possibly on account of treachery, whereupon he appeared as a supporter of the parliamentary cause. Politically active until his death, he received no further preferment.

Vane, Sir Henry (1613-62). English politician, known as the younger Vane. Son of the above



Sir Henry Vane,
English politician
After Lely

Sir Henry, he was born in May, 1613, and educated at Westminster and Magdalen Hall, Oxford. In 1635, having adopted Puritan views, he went to Massachusetts, of which colony he was made governor. Returning to England in 1637, Vane entered parliament, and was knighted in 1640; as one of the parliamentary chiefs he was concerned in the political moves of the next few years, succeeding Pym as leader in 1643. About 1648, however, he separated himself from his colleagues, and consequently had no part in the king's death, but after it he returned to active political life.

Sir Harry proved an able organizer of the commissariat in

Cromwell's Scottish expedition, and a skilful member of the committee of foreign affairs in 1651. His reorganization of the navy was largely responsible for English victories over the Dutch. A firm advocate of tolerance, he enjoyed Cromwell's confidence until he opposed his dictatorial methods. Then he was accused of fomenting Anabaptist agitation and was imprisoned in 1656. After the abdication of Richard Cromwell Vane was appointed a member of the committee of safety and a councillor of state. On the Restoration he was tried for treason, and in spite of an eloquent defence was executed, June 14, 1662. *Consult* Lives, J. K. Hosmer, 1888; W. W. Ireland, 1907.

Väner, VÄNERN, OR WENER. Lake of Central Sweden. It is the largest of lakes occupying part of the subsistence trough connecting the S.W. and E. coasts. It has an area of 2,141 sq. m., and is 93 m. long, 292 ft. in greatest depth, and is situated at an altitude of 144 ft. It outflows by the Göta to the Kattegat. By means of Väner, Vätter, and other lakes, and the Göta and Tröllhätten canals, there is a navigable waterway from Gothenburg to Stockholm. The lakes are frozen from Dec. to May.

Van Eyck. The Flemish artist brothers, Hubert and Jan, are each placed in this work as Eyck.

Van Gogh. This Dutch painter appears as Gogh, Vincent van.

Vanguard. Military term meaning a portion of the advanced guard. The strength and composition of the vanguard depends on the strength of the main body of troops, the type of country in which the force is moving, and the estimated strength of the enemy which may be encountered in the area.

Vanguard. British battleship. Laid down at Clydebank in 1941, and completed in 1945, she cost £9,000,000 exclusive of main armament. Displacing 50,000 tons fully

laden on a length of 814 ft. and a beam of 107 ft., the Vanguard is propelled by geared turbines developing 120,000 s.h.p., and has a speed of 30 knots. Armament consists of eight 15-in., 16 5.25 dual-purpose, and 71 40-mm. guns. She carries a complement of 2,000 officers and men. In 1947 the Vanguard took King George VI and his family to S. Africa for the royal tour of that dominion.

There have been several ships of the R.N. named Vanguard. The first carried the flag of Wynter against the Armada in 1588 and in 1594 that of Frobisher at the siege of Brest. Another Vanguard was flagship of Monk in 1653, and another carried Nelson's flag at the battle of the Nile. In the First Great War, the battleship Vanguard was lost at Scapa Flow on July 9, 1917, as the result of an internal explosion; there were only 97 survivors out of 724.

Vanilla (Vanilla planifolia). Perennial climbing herb of the family Orchidaceae. A native



Vanilla. Flowers and leaves of the Central American orchid. Inset, pod

of Central America, it has large, fleshy, oblong leaves, and green or white and green flowers, succeeded by slender seed-pods, about 6 ins. long, which are utilised for flavouring chocolate, liqueurs, etc. Other species are sometimes used, but



Vanguard. The British battleship, H.M.S. Vanguard, off Spithead. When completed in 1945, she was the Royal Navy's biggest warship, displacing 50,000 tons

are not equal to *V. planifolia*. See Plants, colour plate.

Vanity Fair. In Bunyan's Pilgrim's Progress, one of the dangerous places through which Christian journeyed on his pilgrimage to Zion; a fair wherein were displayed all the worldly vanities for tempting him from his way. Here Faithful was executed by the authorities.

Vanity Fair. Novel by W. M. Thackeray, published in 1848. The author's most characteristic work in the more serious satiric vein, it presents a group of selfish people living, in his own phrase, without God in the world. Social pretence, snobbery, meanness, chicanery are typified and held up to reprobation in the astounding gallery of firmly drawn characters presented in this novel of English life during the early years of the 19th century culminating in the Waterloo campaign. See Sedley, Amelia; Sharp, Becky; Steyne, Marquis of.

Vanloo, JEAN BAPTISTE (1684-1745). French painter. Born at Aix-en-Provence, Jan. 14, 1684, he went to Paris in 1719, becoming an Academician in 1731. He visited England in 1738, where he became a fashionable portrait painter, executing, among others, portraits of Cibber and Walpole. He died at Aix, Dec. 19, 1745. (See Cibber; Hervey, 1st Baron.)

His brother, Charles André (1705-65), was born at Nice, Feb. 15, 1705, and after studying in Rome, settled in Paris, 1734. He became a member of the Academy, 1735, and died July 15, 1765. His Marriage of the Virgin is in the Louvre. See Frederick the Great.

Van Loon, HENDRICK WILLEN (1882-1944). Netherlands-born American historian. He was born at Rotterdam, Jan. 14, 1882, and after studying at Cornell and Harvard settled in the U.S.A. at 21. In turn a journalist and a teacher of history, he achieved a great success in 1922 with the publication of *The Story of Mankind*, a picture history book originally intended for children, but appealing equally to a grown-up audience. Similar books were *Ancient Man*, 1923; *The Home of Mankind*, 1933. Van Loon died March 10, 1944. Report to St. Peter, an incomplete autobiography, appeared in 1948.

Vannes. Town of France. The capital of the dept. of Morbihan, it lies about 2½ m. from the Gulf of Morbihan, 83 m. by rly. N.W. of Nantes, and has steamboat connexion with the chief islands in the gulf. The town is built on a hill, and its small port admits vessels

up to about 300 tons. Salt and grain are exported. The cathedral of S. Pierre contains work of the 13th and 15th-18th centuries; in the N. transept is the tomb of S. Vincent Ferrier, who died here in 1419. There are remains of the town walls, notably the 14th century Tour du Connétable. Vannes takes its name from the Celtic Veneti, whose capital it was. In German occupation during the Second Great War from June, 1940, it was already under the control of the French forces of the interior when it was entered by a U.S. armoured column Aug. 6, 1944. Pop. 28,189.

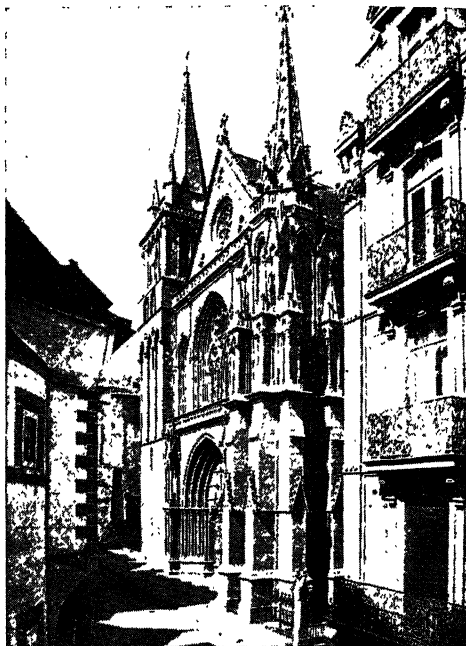
Vansittart, ROBERT GILBERT VANSITTART, 1ST BARON (b. 1881). British civil servant and publicist.



Lord Vansittart,
British publicist

He was born June 25, 1881, and educated at Eton. On the staff of the foreign office he served in Paris, Teheran, Cairo, and Stockholm. During 1920-24 he was secretary to Curzon, then foreign minister, and during 1928-30 principal private secretary to the prime minister. In 1938-41 he was chief diplomatic adviser to the foreign secretary. Knighted 1929, Sir Robert was raised to the peerage in 1941. Vansittart's opinion that the Germans held the main responsibility for aggressive wars over centuries found expression in contributions to a wide range of periodicals and newspapers, and also in a booklet, *Black Record*, widely circulated during the Second Great War. He also made a name as a playwright, with *People Like Ourselves*, *Dead Heat*, and *Sweet William*. A book of memoirs, *Lessons of My Life*, appeared in 1945.

Vansittart, NICHOLAS. This British politician is dealt with under his later title, Baron Bexley.



Vannes, France. West front and portal, rebuilt in 1875, of the 13th century cathedral of S. Pierre

Van 't Hoff, JACOBUS HENRICUS (1852-1911). Dutch chemist. Born at Rotterdam, Aug. 30, 1852, and educated at Delft, Leyden, Bonn, and Paris, he graduated at Utrecht, 1874. In 1878 he became professor of chemistry at Amsterdam, and in 1896 research professor of chemistry at the Royal Prussian academy of sciences, Berlin. Van 't Hoff is chiefly known for the theory he formed that the graphic chemical formulae developed by Kekulé must be extended in three-dimensional space to accord with the facts of organic chemistry. This theory laid the foundation of stereochemistry.

Next followed a study of the laws of chemical equilibrium, which enabled the Stassfurt salt deposits to be worked to economic advantage. Van 't Hoff was awarded the Nobel prize for chemistry in 1901. He died March 2, 1911.

Vanzetti, BARTOLOMEO. This central figure in an American cause célèbre is dealt with under Sacco-Vanzetti Case.

Vaporiser. Apparatus for delivering a liquid as a spray, usually for treatment of nose or throat.



J. H. Van 't Hoff,
Dutch chemist

The simplest instrument forces air from a rubber bulb, drawing liquid from a container beneath and delivering it from a tube in the form of a fine spray or mist. Vaporisers are usually of metal and glass, but all-glass models are made. Medicaments can also be carried with moist vapour generated in an inhaler or croup kettle.

Vapour (Lat. *vapor*, steam). In physics, the gaseous form assumed normally by a liquid and occasionally by a solid when passing out of those states. The pressure exerted by the gas is termed the vapour pressure. If several gases or vapours are present in the same space each exerts the pressure it would exert in the absence of the others. In meteorology, the V.P. is that part of the total atmospheric pressure due to water vapour. See Gas.

Vaquier, JEAN PIERRE (ex. 1924). Basque poisoner. While working at a hotel in Biarritz in 1924, he met Mrs. Mabel Theresa Jones, wife of the proprietor of the Blue Anchor inn, Byfleet, Surrey. Becoming infatuated, he followed her to England, stayed at a London hotel, and eventually went to Byfleet, where Jones was recovering from an illness. On March 1, 1924, Vaquier was in London, where he bought strychnine, alleging that he was going to use it for wireless experiments. On March 29 Jones took some health salts, and died of strychnine poisoning within a few hours. Vaquier was arrested on April 19, was tried at Guildford in July, found guilty, and executed at Wandsworth Aug. 12, 1924.

Var. Dept. of France. Part of the former prov. of Provence, it is adjacent to the depts. of Alpes-Maritimes, Basses-Alpes, and Bouches-du-Rhône, bounded S. by the Mediterranean. In the S. are the mountainous chains of the Maures and Estérel, and to the N. the S. buttresses of the French Alps. The natural beauty of Var is heightened by its fine climate, and the coast is dotted with beautiful bays. The Argens river flows from W. to E. to the sea near Fréjus; other streams are the Siagne, Aille, Dardennes, Gapeau, Verdon, and Artuby. Iron, salt, lead, and marble are found. There are sardine, tunny, and anchovy fisheries. The capital is Draguignan. Its area is 2,333 sq. m. Pop. 370,688.

Varallo. Town of Piedmont, Italy. In the prov. of Verceili, it lies S.E. of Monte Rosa in the Sesia valley, 34 m. by rly. N.W. of Novara. Near by is the pilgrimage resort of Sacro Monte. Cottons are manufactured. Pop. 3,500.

Varanger Fjord. Arm of the Arctic Ocean in N.E. Norway. The port of Vardø at its entrance is ice-free all the year round. Vadsø, Nasseby, and Nyborg are among other settlements. Lapps rear reindeer in the neighbourhood. It receives the waters of the Neidenelv, whose valley provides an easy route from the fjord to Finland.

Varangians (Late Gr. *Barangoi*. fr. Old Norse *vaeringjar*, followers, retainers). Name applied to the bands of Norsemen who organized the Russian state in the 9th century, and were gradually absorbed by the Slavs.

The Varangian guard, a mercenary force containing many Englishmen, was maintained at Constantinople by the East Roman emperors. It originated with a body of troops obtained in 988 by Basil II (g.v.) from Vladimir, prince of Kiev. See Russia.

Vardar (Gr. *Axios*). Yugoslav name of a river of the Balkans. It rises in the Sar Plan (Shar Dag), in S. Serbia, Yugoslavia, and flows N.W., then bends S.E. towards Skopje, and, after a S.E. course, falls into the Gulf of Salonica, about 10 m. W. of the city of that name. Its length is 200 m. With its tribs., the Bregalnitsa on the E., and the Tcherina on the W., it figured in the first and second Balkan Wars, and in the First Great War.

In the latter there were two battles of the Vardar, fought between the Allies and Bulgaria. The first began Oct. 19, 1915, shortly after the arrival of the Salonica expedition of the Allies. The French were railed up the Vardar valley to link up with the Serbians, but the Allies were insufficiently strong to maintain any prolonged advance, and retired into Greece on Dec. 12. The second battle was fought Sept. 15-30, 1918. It took the form of a strong Allied offensive and a Bulgarian retreat which lasted until the armistice with Bulgaria, Sept. 30.

Varden, DOLLY. Character in Dickens's novel *Barnaby Rudge*, the beautiful, coquettish, charming daughter of the locksmith Gabriel Varden. She gave her name to a style of hat, popular in the 1880s, a small flat bedflowered bonnet perched on the top of the coiffure and tied with ribbons below the chin.

Vardö. Seaport and fishing town of N.E. Norway, in the co. of Finmark. It is situated on an island at the N.W. entrance to Varanger Fjord. The fortress of Vardöhus, the most northerly in

the world, dates from the 14th century. There are extensive cod fisheries in the neighbouring water, and the harbour, which is ice-free, exports codfish and cod-liver oil.

Vardon, HARRY (1870-1937). British professional golfer. This Jerseyman, born at Grouville May 9, 1870, came to Totteridge as professional to the S. Herts golf club in 1903 and remained there till his death, March 20, 1937. Except that his putting was



Harry Vardon, professional golfer

fallible, he was probably the finest player of all time. Six open championships were gained, in 1896-98-99, 1903-11-14. He won the American title in 1900, tied for it in 1913, and finished second in 1920 when 50 years old. In remarkable matches at the turn of the century Vardon beat Taylor and Park; and in 1905 with Taylor he defeated Braid and Herd in foursomes. Playing 36 holes against Massy in France, 1910, Vardon ended 18 up. He was a fine teacher, and superintended the laying out of courses.

Varennes. Village of France, in the dept. of Meuse. On the river Aire, 18 m. W.N.W. of Verdun, it figured in a famous incident of the French Revolution, for Louis XVI and his family, seeking to leave the country, were stopped here on June 21, 1791. In German occupation throughout most of the First Great War, Varennes was in ruins when recovered by American troops on Sept. 26, 1918.

Varese. Town of Italy, in the prov. of Varese. It is 10 m. E. of Lake Maggiore, and is a rly. junction 37 m. N.N.W. of Milan. The 16th century church of San Vittore and the ducal palace, now a museum with a valuable collection of historical and antiquarian relics, are the principal buildings. Wine, silk, paper, organs, and carriages are manufactured. Pop. 44,832.

Vargas, GETULIO DORNELLES (b. 1882). Brazilian statesman. After study at Porto Alegre faculty of law, he entered politics in 1911 as deputy in the Rio Grande do Sul state congress, a position he retained until 1919, and again 1922-26. He was president of that state from 1927 until 1930, when he led the revolutionary movement that resulted in his

becoming president of Brazil. Vargas assumed dictatorial powers, and was re-elected when in 1934 a new constitution was proclaimed. He made the opening address to delegates of 21 American republics at the Rio conference in 1942, announcing his country's entry in the Second Great War on Aug. 22. Next year he conferred with Roosevelt at Natal, Brazil, on Brazil's contribution to the U.N. war programme. Vargas was compelled by army leaders to resign, Oct. 29, 1945. The elections of Oct., 1950, returned him to the presidency for 1951.

Vargas, Luis de (1502-68). Spanish painter. Born in Seville, he studied in Rome, and remained in Italy, c. 1527-55. He excelled in religious subjects, especially in fresco, but much of his work in this medium has perished. His best work in oils is in the cathedral of Seville, and there are examples in the Louvre and the Prado at Madrid.

Vargas Diamond. Reputedly the third largest diamond in the world. It was found at Minas Geraes, Brazil, in 1938, and named after President G. D. Vargas (*q.v.*). Sold to a Dutch firm for about £80,000, it weighed 726 carats. In 1941 it was announced that the diamond was to be cut into 20 gems.

Variable Pitch. Mechanical method of altering the angle of an airscrew's blade to attain maximum efficiency at varying altitudes. See *Airscrew*.

Variation. Biological term applied to diversity of any kind among organisms of a particular race which are in the same stage of development. As the sum total of such diversity may be almost infinite, no system has yet been devised for studying it completely. Studies of the manner in which races vary in special features show that at least two sets of causes interact for the production of variation as a whole. These are differences in heritable constitution and in environment. Well defined features of members of one race developing in the same surroundings are often found to vary in such a way that they may be separated into circumscribed categories. This discontinuous variation is often called Mendelian variation, since the features behave in breeding according to Mendel's laws.

Organisms, on the other hand, having so far as can be determined the same genetical constitution, exhibit features such as height and

weight whose magnitudes form a continuous series. These are continuous variations. When studied statistically they are found to obey the laws which govern the effect of numerous independent chances interacting to a common end. Chance incidence of many environmental conditions will have their chief effect on organisms during their development; hence continuous variation is also sometimes environmental or developmental, though not necessarily. Interaction of many heritable factors distributed according to the laws of chance will also produce continuous variation. See *Evolution*; *Mendelism*.

Variations. In music, the ornamentation and development of a given theme. In the 16th century, composers began to elaborate their music by devices of figuration and imitation, which reached culmination in such forms as the ground bass, chaconne, and passacaglia. In these the theme was either untouched or so little altered as to be readily recognizable throughout.

Beethoven, Mendelssohn, and others tended to regard the theme as affording opportunities of development, so that the interest should be cumulative. Beethoven's variations for piano on a waltz by Diabelli may be cited as typical of the new viewpoint. Some fine works for full orchestra are Brahms's variations on a theme of Haydn; Elgar's on an original theme (*Enigma*); Dvořák's symphonic variations; and those of Franck for piano and orchestra. Tchaikovsky rounds off his third suite with a theme and variations, and Glazounov uses that form for the slow movements of his sixth symphony and piano concerto.

Variations, CALCULUS OF. Mathematical term for methods of applying the differential and integral calculus to problems concerning not so much the values of functions as the variations of those values. One of the earliest problems of this type was the famous brachistochrone problem posed by John Bernoulli in 1696: To find the path from point O to point A along which a particle could move freely under gravity in the shortest time. The calculus of variations deals principally with questions of maximum and minimum values under complex conditions.

Varicocele. Condition in which the veins of a testis are dilated, back pressure causing fluid to form in the sac containing the testis. The fluid usually has to be

drawn off while the cause of back pressure is investigated.

Varicose Veins. Condition in which the veins of the leg are prominent, tortuous, dilated, and diseased. The tortuosity is associated with distortion of the valves inside the vein in advanced cases. Varicose veins give rise to but few symptoms until they reach a fairly advanced stage. The legs then become heavy, aching, and tired. Neglected varicose veins give rise to complications, amongst the most important being ulceration, eczema, swelling, and thrombophlebitis (inflammation of the vein associated with clots).

At least 10 p.c. of the pop. suffer from this complaint to some extent, i.e. in the U.K. there may be five million sufferers. No precise cause is known; but heredity plays an important part in the incidence of the disease, while the erect stance of the human being is probably the most important factor. The disease is more prevalent in those whose work compels them to stand for long periods of time, e.g. waiters, policemen, nurses; and can be caused by disturbance of muscle balance due to flat foot and similar conditions. The disease does not appear in the quadruped.

Recognition of varicose veins is simple; correct treatment for the individual case is a matter for expert advice. All cases can be benefited by correct treatment; and complications can usually be avoided by sufficiently early treatment. Patients suffering from the dreaded complications of ulceration, phlebitis, etc., are in general lazy and tolerant individuals who have not taken the trouble to have the primary disease of varicose veins adequately treated. All sufferers should therefore seek advice early.

In some instances surgery offers the best chance of cure. The operation can be performed under local anaesthesia within an average period of 24 hrs.; the surface veins are tied off at thigh and ankle and the bloodstream thus forced to seek a deeper channel. Mild varicose veins can be benefited by injection. This treatment may have to be renewed, but in selected cases good results follow careful use of the injection fluid, or sclerosant.

Patients in whom added complications are present (such as damage to the deep veins of the leg or the presence of some general debilitating disease) may obtain the necessary support for

the limb by elastic stockings or bandages or some form of adhesive plasters.

Variolite. Obsolete name for a dark green variety of the mineral orthoclase (q.v.). It came from late Lat. *variola*, small-pox, the stone once being thought a cure for the disease.

Varley, JOHN (1778-1842). British artist. Born at Hackney, Aug. 17, 1778, he studied under J. C. Barrow, and was an original member of the Water Colour Society (founded 1804). Exhibiting at the R.A. from 1798, he painted landscapes and sea pieces, was the friend and benefactor of Blake, a teacher of art, and an amateur astrologer and prophet. He died in London, Nov. 17, 1842.

Varna. Seaport of Bulgaria. It stands on the N. shore of Varna Bay, an inlet of the Black Sea,



Varna. Orthodox Greek cathedral of the Bulgarian seaport

and is 325 m. by rly. E.N.E. of Sofia. As a seaport it ranks with Burgas; there are extensive harbour works, and exports include cattle and dairy produce, grain, leather, wine, and cloth. Heavily fortified, it is the seat of a Greek metropolitan and, since 1870, of a Bulgarian bishop; it has a notable cathedral. Wladyslaw I of Hungary was defeated and killed here, Nov. 10, 1444, in his second campaign against the Turks. Varna was occupied by the Russians in 1828, and in 1854 by the Allies, who organized here the invasion of the Crimea. Ceded to Bulgaria by the treaty of Berlin, 1878, the town was bombarded by the Russian Black Sea fleet in 1915. During the Second Great War it was occupied by the Russians, Sept. 8, 1944. The town was renamed Stalin in 1949. Pop. 69,944.

Varnish. Solution forming a hard, shiny film over a surface on drying. Varnishes are of two classes—oil and spirit. Oil varnishes consist essentially of resins, natural or synthetic, combined with drying oil (usually linseed, sometimes also China wood),

driers (usually compounds of lead, cobalt, or manganese), and thinned to working consistency with volatile solvents. The film, therefore, dries at first by evaporation of the solvent and then by changes in the residual film, due partly to oxidation of the oil by reaction with oxygen from the air and partly to polymerisation. Spirit varnishes consist of resin dissolved in a volatile solvent; drying is due to evaporation of the solvent.

OIL VARNISHES. The resin gives the film hardness, the oil content controls the elasticity and, according to the treatment during manufacture, affects gloss and durability. Copal resins are commonly used in oil varnishes. Insoluble in oil in their natural state, they must first be "run," i.e. partially decomposed by heat. In this process they lose 15-30

p.c. by weight. Great care in the addition of the oil and subsequent "cooking" is necessary to obtain a stable mixture. Thinners are added and the varnish has then to be matured for from a few weeks to three years, during which time

complex changes occur and undesirable substances are precipitated. Filtration assists clarification, but time is essential to the production of first-class varnish. With synthetic and modified natural resins, the running process is eliminated, but heat treatment of the oils and of the oil-resin mixture still determines the quality of the varnish. Much research is directed to producing varnishes which combine very rapid drying with a high durability and gloss. Here, and in waterproof varnishes, china wood oil is valuable.

Varnishes are classified according to their resin-oil ratio: long oil contains less than $\frac{1}{2}$ resin; medium $\frac{1}{2}$ to $\frac{3}{4}$, short $\frac{3}{4}$ to 1. Long oil varnishes are highly elastic, short oil tend to be brittle. Short oil varnishes of the lowest oil content (rubbing varnishes) are applied as foundations for subsequent coats, before applying which the surface is rubbed down with a fine abrasive. Varnishes for seats, etc., are on the "short" side because they must be hard, while a high degree of elasticity and durability is not required. Coach varnishes must be very durable

and also very elastic, to withstand vibration and mechanical shock. Boat varnishes must have similar properties, and in addition a high degree of water resistance. Ordinary outside varnishes are somewhat inferior to coach varnishes in hardness; inside varnishes vary from the "church oak" type, in which hardness is rather more important than elasticity, to long oil elastic varnishes used on ordinary woodwork for decorative purposes.

SPIRIT VARNISHES. The two most important groups are: (1) *Shellac varnishes*, of which French polish is typical, made by dissolving lac resin in alcohol (about 3 lb. to a gallon). Cheaper finishes contain varying amounts of spirit-soluble resins such as manila copal; they have less durability and water resistance. Very cheap varnishes for articles of temporary value such as toys may consist of little more than rosin or ester gum dissolved in suitable volatile solvents with perhaps a little oil added to give elasticity. An almost colourless series of shellac varnishes is made from bleached lac.

(2) *Manila spirit varnishes*. The alcohol soluble grades of manila copal yield a series of transparent spirit varnishes, the lightest being white hard spirit varnish. Darker grades of the resin yield brown hard spirit varnish. Price and quality can be reduced by using rosin or ester gum.

Other spirit varnishes of less commercial importance are the mastic varnish used by artists to protect oil paintings. This consists of mastic dissolved in turpentine. A harder and more brittle varnish is obtained from sandarac resin.

BITUMINOUS VARNISHES. Natural pitches, asphalts, and bitumens used in the manufacture of varnishes include Gilsonite from the U.S.A., Manjabs from Barbados, and asphalt from Trinidad. Industrial products include the residues from petroleum distillation and coal tar pitches. Stearine pitch, produced in the distillation of fatty acids, is used with the natural bitumens as it reduces sensitivity to light and increases elasticity. The more soluble bitumens are used in making black stoving varnishes and similar cheap protective coatings for metal work, e.g. mudguards of motor cars and bicycle frames. A high class bituminous varnish is as carefully made as a good oil varnish, and the best grades possess a high degree of efficiency for the service for which they are

designed. See Lac; Resin. Consult Varnish Making, T. H. Barry and Y. W. Dunster, 1934.

T. Hedley Barry

Varnish Tree (*Melanorrhoea usitata*). Evergreen tree of the family Anacardiaceae. A native



Varnish Tree. Spray of leaves of the evergreen tree. Inset, flower cluster, and, top, single flower

of the East Indies, it grows to a height of 100 ft., and has thick, oval, alternate leaves. The red flowers are produced in clusters from the base of the leaves. The timber is hard, heavy, and dark-coloured, one of several kinds known as *lignum vitae*. The sap is used as a lacquer for domestic articles.

Varro, MARCUS TERENTIUS (116–28 B.C.). Roman scholar and miscellaneous writer. Born at Reate, in the Sabine country, he studied at Athens, and distinguished himself at sea in Pompey's war against the pirates. Having followed Pompey in the civil war, he was pardoned after the battle of Pharsalus, 48 B.C., and spent the rest of his life in study. Most learned and voluminous of Roman authors, he wrote a great work on the political and religious antiquities of Rome, papers on the liberal arts, philosophy, geography, and law, as well as the *Saturae Menippeae*, a medley of prose and verse. Apart from fragments, valuable for the information they give on Roman institutions, his only extant works are the philological treatise, *De Lingua Latina*, and the treatise on agriculture, *De Re Rustica*, Eng. trans. On Farming, L. Storr-Weston, 1912.

Varus, PUBLIUS QUINTILIUS (d. A.D. 9). Roman general. Having been consul and governor of Syria, he was in A.D. 7 appointed to the chief command in Germany, where his vexatious administration roused the Germans to revolt in 9, under the able leadership of Arminius (q.v.). The Romans were caught in the swamps of the

Teutoburger Wald, three legions were annihilated, and Varus committed suicide, as the result of what Creasy calls one of the world's decisive battles.

Varves. Rhythmic layers found in clays which were deposited in lakes fed by water flowing directly from glaciers. The ground-up rock-flour and fine detritus were carried down into the lakes during summer when the ice melted; but in winter the supply of transported material was negligible. Because of this the coarser sediment supplied in summer sank rapidly to the bottom of the lake, but in winter the fine material in suspension had time slowly to settle. Each year therefore a double layer, or varve, was deposited. Thick deposits of such varved clays have been formed over long periods, and the length of time required for laying down individual deposits can be accurately estimated by counting the annual varves. Correlation between varved clays permits the establishment of a time scale of geological events which reaches back some 13,000 years. Use of varves was first recognized by Baron de Geer in Sweden in 1885. See Ice Age; consult Dating the Past, F. E. Zeuner, 1946.

Vasa. Seaport of Finland. Formerly Nikolaistad, it is the capital of the dept. of Vasa, on the E. side of the Gulf of Bothnia, almost opposite the island of Björkö. A rly. terminus and seaport, it has a nautical school and shipbuilding yard, and trades in timber products, oats, and fish. The original town founded in 1606 was burned down in 1852, and rebuilt on its present site, 3 m. to the N.W., in 1862. Pop. 36,597. Vasa dept. has an area of 15,062 sq. m. and pop. 599,774.

Vasa. Family name of the rulers of Sweden from 1523 to 1654. The first was Gustavus I (q.v.), who secured the throne in 1523. The last was Christina, daughter of Gustavus Adolphus, who abdicated in 1654. Collateral descendants held the throne until 1818. A branch of the family gave three kings to Poland, who reigned there 1557–1668. See Sweden.

Vasari, GIORGIO (1511–74). Italian architect, painter, and author. Born at Arezzo, July 30, 1511, he attracted in youth the attention of Cardinal Passerini, and was by him taken to Florence, where he studied under Michelangelo and Bandinelli, and secured the patronage of the Medici. On their exile he removed to Rome,

where, although only 18, he won honour as an artist. Political insecurity led to his moving between Arezzo and Florence, and he visited Mantua and Venice in 1541. Cardinal Farnese suggested his writing *The Lives of the Painters*, which Vasari published in 1550. Farnese also gave him the commission to execute the frescoes of the Cancellaria. In 1553 he returned to Florence, where he mostly remained for the rest of his life. He effected the restoration of the ducal palace, and was at work on the frescoes of S. Maria del Fiore when he died, June 27, 1574. Vasari's paintings have scarcely stood the test of time.

Vasco da Gama (c. 1460–1524). Portuguese navigator, entered as Gama, Vasco da.

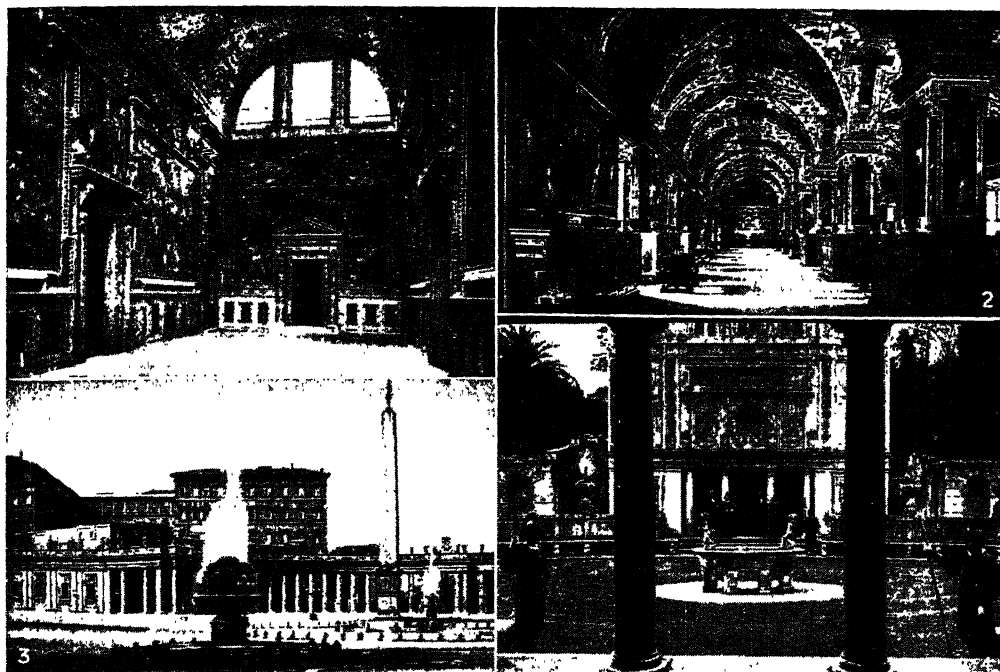
Vascular Bundle (Lat. *vasculum*, small vessel). In botany, a system of vessels or tubes composed of long, narrow specialised cells which transport water and food through the plant.

Vascular System (Lat. *vasculum*, small vessel). In anatomy and physiology, system consisting of the heart, arteries, veins, capillaries, and lymph vessels and glands, which maintain the circulation of the blood and lymph throughout the body. See Blood; Heart; Lymph.

Vas Deferens. Duct by which sperms reach the urethra in birds, mammals, and reptiles. It is the Wolffian duct, originally draining the mesonephros, which remains as the epididymis applied to the testis. Section and ligation of the duct will produce sterility without interfering with the activity of the testes in the production of hormones; this operation is called vasectomy.

Vase (Lat. *vas*, a vessel). Vessel, usually tall in relation to its width, and decorative in design or purpose. Generally coverless, it may be without handles, or have two symmetrical handles. The term denotes numerous types of Oriental porcelain and of ancient Greek pottery—often wrongly called Etruscan—whose vase-paintings are a priceless record of contemporary life. The engraved silver vase of Entemena at Lagash is dated 2950 B.C. Egyptian vases were often of porphyry or alabaster; one is 32 ins. high. See Jasper; Portland Vase; Rockingham Ware; Samian Ware.

Vassal. Word of doubtful origin meaning a tenant or dependent. It is chiefly used in connexion with the feudal system for one



Vatican, Rome. 1. Sala Regia, the hall where ambassadors were formerly received, completed in 1578. 2. Great hall of the library, profusely decorated and containing cases in which are preserved many priceless MSS. and books. 3. The palace, from the piazza of S. Peter. 4. Villa Pia, a summer-house in the extensive gardens, built by Pius IV in 1560

who was subject to the authority of a lord. See Feudalism.

Vassilievsky, ALEXANDER MIKHAILOVICH (b. 1900). Russian soldier. Son of a Volga peasant, he entered the Imperial army, but joined the Bolsheviks in the Revolution of 1917. A product of the Russian general staff schools, he helped to reorganize Soviet armies in 1940, and was attached to the high command on his country's entry into the Second Great War. Created marshal, 1942, and chief of staff, 1943, he planned the counter-offensive carried out by Zhukov against the Germans at Stalingrad (see Stalingrad, Battle of). In 1945 he assumed command of the 3rd White Russian army, after Chernyakhovsky's death, and completed the conquest of E. Prussia. He was c.-in.-c. of the force which occupied Manchuria in Aug. that year. Appointed deputy minister to Marshal Bulganin, 1947, he succeeded him as minister for the armed forces, 1949, and was elected to the supreme soviet, 1950. Twice a Hero of the Soviet Union, and holding the Order of Victory, Vassilievsky was made G.B.E., 1944.

Västerås. City of Sweden, in the co. of Västmanland. It stands on the N. shore of Lake Mälär. 69

m. by rly. W.N.W. of Stockholm. The fine Gothic cathedral, built by Birger Jarl on the site of an earlier church, was consecrated in 1271, and has been twice restored. It has the loftiest tower in Sweden (309 ft.). Iron and copper are mined, sulphuric acid and aluminium are manufactured, and ships are built. Here Gustavus Vasa defeated the Danes in 1521 and six years later held a diet which established Protestantism in Sweden. Pop. 51,034.

Vasto. Town of Italy, in the prov. of Chieti. It stands on rising ground $1\frac{1}{2}$ m. from the Adriatic Sea, 131 m. by rly. S.S.E. of Ancona. With walls dating from the Middle Ages, it has a Gothic cathedral, an old castle, and a town hall containing a museum of Roman antiquities. Silks, wines, wax candles, and bricks are the chief products, while fishing and olive culture are carried on.

Vathek. Romance by William Beckford. Named after its principal figure, it was written in French, and published in French in 1787. Samuel Henley's Eng. trans. had appeared a year earlier. Vathek is regarded as the most remarkable Oriental tale imagined and written by a European author.

Vatican City. Official residence of the pope in Rome. It lies on a

low hill, the Mons Vaticanus of ancient Rome, within a N.W. extension of the city walls, immediately to the N. of S. Peter's, and consists of a vast irregular group of palaces, courts, chapels, and offices, with a large private garden; the whole area, 108.7 acres, including S. Peter's and other buildings, being extraterritorial, under the sovereignty of the pope, who has resided here since 1870. Popes regarded themselves as prisoners until 1929, when three treaties were signed between the Holy See and the Italian govt., regulating political, spiritual, and financial matters and confirming the papal jurisdiction in Vatican City. (See Papacy.)

Pope Symmachus about 500 built a house here, which was rebuilt about 1200, but the Lateran palace was the usual papal residence until the popes moved to Avignon. Gregory XI, who restored the papal seat to Rome in 1377, made the Vatican his permanent residence, though later popes often lived in the Quirinal, which was originally a summer palace. The existing buildings of the Vatican were begun about 1450 by Nicholas V, who reconstructed the older palace on a grand scale. Additions were made by later popes, the last important building, the Braccio

Nuovo, having been erected under Pius VII. The Vatican is said to contain about 7,000 rooms.

The Borgia apartments, begun by Nicholas V and finished by Alexander VI, were the scene of the latter pope's murder by poison. Some rooms were decorated by Pinturicchio, and others by Perugino and Sodoma. Four entire rooms, today known as the Stanze di Raffaello, were treated by Raphael. After the fall of the hated Borgias the Pinturicchio frescoes remained neglected and covered up until their restoration in 1890-97. The most famous of the Vatican chapels is the Sistine Chapel (*q.v.*), built by Sixtus IV. It is approached by the Scala Regia, a staircase designed by Bernini, and the Sala Regia, a hall decorated with scenes from the lives of the popes. The little chapel of Nicholas V has frescoes of the lives and deaths of SS. Stephen and Lawrence, painted on the walls by Fra Angelico.

East of the court of Damascus, built by Leo X, is the Apostolic Residence, a lofty building surrounding a quadrangle, and overlooking the piazza of S. Peter. It contains the private apartments of the pope. E. of it are the barracks of the Swiss Guards. The great N. wing of the Vatican, a quarter of a mile long, consists of the Belvedere, a villa built by Innocent VIII, and two parallel galleries connecting it with the old palace. This wing houses the library and most of the art collections. The library contains some 34,000 MSS., and about 250,000 printed books. The museums are devoted to (1) classical antiquities, Greek and Roman, Etruscan, and Egyptian, collected in the first place by Julius II, Leo X, Clement VII, and Paul III, and developed by Pius VI, Pius VII, and Gregory XVI; and (2) Early Christian relics, gathered from the catacombs. Among the Vatican's statuary may be cited the two Discoboli, after Myron, the Apollo Belvedere, the Laocoon, and the Doryphorus, after Polyclitus (*q.v.*). See Colonade; Conclave; Rome; St. Peter's.

Vatican Council. Council of the R.C. Church, summoned by Pius IX in 1868. The encyclical convoking it was issued June 29, 1868, just over 300 years after the dissolution of the council of Trent (*q.v.*), and at a time judged by many Roman Catholics to be inopportune. Pius was determined, however, and the council met at St. Peter's, Dec. 8, 1869. There were over 700 prelates present, including 49 cardinals, 121 archbishops,

and 479 bishops. Several sessions were devoted to restating theological points before the real subject of the council was reached, but on July 18, 1870, the definition was made of papal infallibility (*q.v.*). Although little, if any, doubt was expressed as to the doctrine itself, many prelates felt grave doubts as to the opportuneness of its definition. The outbreak of the Franco-Prussian War and the capture of Rome by the Italians necessitated an adjournment on Oct. 20.

Vatnajökull. Icefield of S.E. Iceland. It is an elevated mass culminating in the height of Öræfa Jökull at 6,425 ft., covered by the largest icefield in the island. Volcanic eruptions occurred in 1389 and 1753.

Vattel, EMMERICH DE (1714-67). Swiss jurist. Born at Couvet, April 25, 1714, and educated at Basel and Geneva, he entered the state service of Saxony and went to Berlin as minister of the elector, Augustus III, 1746. He wrote on literature and jurisprudence, and in 1758 published in French his famous work on the Law of Nations. This was translated into many languages. Vattel died Dec. 28, 1767.

Vättern, VÄTTERN, OR WETTER. Lake of Central Sweden. It is the second in size of the subsidence lakes, has an area of 733 sq. m., is 81 m. long, and 390 ft. in greatest depth. It is situated at an alt. of 289 ft. It drains to the Baltic by the Motala. See Väner.

Vatutin, NIKOLAI FIODOROVICH (1900-44). Russian soldier. Born Dec. 16, 1900, he joined the Red army in 1920 and the Communist party next year. From the beginning of the German attack on Russia in 1941, he was given a command at the front. His first major achievement was the recapture, Feb. 13, 1943, of Voroshilovgrad, overcoming elaborate defences built by the Germans. He collaborated with Koniev and Malinowski in the final recapture of Kharkov, Aug. 23, and commanded the 1st Ukrainian army which, after a brilliant outflanking movement, took Kiev by storm Nov. 6. During the rest of the winter of 1943-44 he was engaged in a contest with von Manstein, in which he made great use of cavalry, capturing, losing, and recapturing Zhitomir and Korosten. He took Sarny (in pre-war Poland) on Jan. 12, 1944, and with Koniev encircled and annihilated 10 German divs. near Korsun on the Dnieper, Feb. 3-18. But on March 5 it was announced that on account of ill-

ness he had been replaced by Zhukov. Vatutin died in Kiev April 14, 1944. He received the order of Lenin in 1941, of Suvorov in 1942.

Vauban, SEBASTIEN LE PRES-TRE DE (1633-1707). French military engineer. Born in a Burgundian village, he was educated at Semur and about 1650 entered the army. In charge of various siege operations during the war with Spain, after the peace of 1659 he turned his attention to fortress work. Vauban's fame rests on the work he did for France during wars carried on by Louis XIV. About forty fortresses were taken under his direction, and here his genius was most fully shown. He modernised almost every fortress on the French borders, the total number on which he was employed being put at over 160. He was a marshal when he died, March 30, 1707. See Fortification. Consult Vauban: Builder of Fortresses, E. Halévy, Eng. trans., 1924.

Vaucluse. Dept. of France. Part of the former prov. of Provence, the principality of Orange, and the papal territory of Avignon, it is adjacent to the depts. of Ardèche, Drôme, Basses-Alpes, Bouches-du-Rhône, and Gard. A small portion of this dept. is entirely surrounded by Drôme. A broad alluvial plain lies in the W., and to the E. rises the Alpine buttress round Mt. Ventoux; farther S. are the Plateau de Vaucluse and the Lubéron chain. The Rhône and Durance bound the dept. on the W., and numerous tributaries of these include the Lauzon, Lez, Meyne, Nesque, Ouvèze, Auzon, and Mède. Chiefly agricultural, Vaucluse produces cereals, vegetables, fruit, vines, olives. Avignon is the capital. The dept.'s area is 1,381 sq. m. Pop. 249,838.

Vaud. Canton of Switzerland. It adjoins France and the Lake of Geneva, and is mainly an elevated plateau between the Jura Mts. and the lake, its greatest height being the Diablerets, 10,650 ft. Lausanne is the capital. Montreux, Vevey, and Château d'Oex are tourist resorts, the first two on the Lake of Geneva. The inhabitants are chiefly French-speaking Protestants. Formerly part of the kingdom of Arles, the dist. became imperial in the



Sebastien de Vauban,
French soldier
After Lebrun

11th century. The counts of Savoy ruled over it in the 13th century; Berne governed it during the 15th and 16th centuries. It became a canton of the Swiss confederation in 1803. Its area is 1,239 sq. m. Pop. 343,398.

Vaudeville. In drama, originally a light and amusing play in which dialogue is intermingled with songs, and almost identical with musical comedy. The term originated in the 15th century with Olivier Basselin of the valleys of the Vire, in Normandy, the author of a number of drinking and love songs, which he circulated under the title *Lais des Vaux de Vire*, of which Vaudeville is a corruption. In the 20th century the word has become almost synonymous with theatrical variety.

Vaudeville Theatre. London playhouse on the N. side of the Strand. It was opened April 16, 1870, with a performance of *For Love or Money*, and for many years was famous for comedies, e.g. *Our Boys*, 1875. It was reconstructed and reopened in 1891, and put on children's plays, comedies, and musical pieces, e.g. *Bluebell in Fairyland*, 1901; *Quality Street*, 1902; *Jack Straw*, 1908. The First Great War brought revues like *Buzz-Buzz*. Again remodelled, it reopened under the management of Archibald de Bear, in 1926, with the revue *R.S.V.P.* Later successes were *Lottie Dundass*, 1943; *No Medals*, 1944; *Now Barabbas*, 1947; *The Chiltern Hundreds*, 1948. The theatre seats 650.

Vaudois. Alternative name of the religious community better known as the Waldenses (*q.v.*).

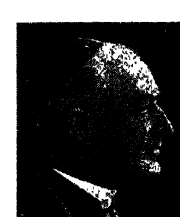
Vaughan, BERNARD (1847-1922). British priest. A younger brother of Cardinal Herbert Vaughan, he was born Aug. 20, 1847. Educated at Stonyhurst, he became a priest and joined the Society of Jesus. From 1883 to 1901 he worked in Salford, later removing to London, where he preached eloquently at the Jesuit church in Farm Street. Some of his addresses on social questions were published as *The Sins of Society*, 1906. He died Oct. 31, 1922. A memoir by C. C. Martin-dale appeared in 1923.

Vaughan, CHARLES JOHN (1816-97). British divine. A Leicester boy, he was educated at Rugby

and Trinity College, Cambridge, where he was bracketed senior classic. In 1841 he was ordained in the Church of England and passed three years as vicar of S. Martin's, Leicester. During 1844-59 Vaughan was headmaster of Harrow, and from 1860 to 1869 vicar of Doncaster. Then he was chosen master of the Temple, and in 1879 dean of Llandaff. He died Oct. 15, 1897. As headmaster, his personal influence was great.

Vaughan, HENRY (1622-95). Welsh poet. Born at Newton-on-Usk, April 17, 1622, he studied law, but became a practising physician at Brecon, where he favoured the Royalist cause in the Civil War. Known as the Silurist, his birthplace being in the old country of the Silures, Vaughan as a poet was influenced by the "metaphysical" school of Donne, Carew, and Herbert. Their work partly inspired his devotional volume, *Silex Scintillans*, 1650, which in turn was to influence Wordsworth. Of the poems, edited by E. K. Chambers in 1896, the most famous are *The Retreat*; the lines beginning *They are all gone into the world of light*; and the exquisite *My soul, there is a country*. The translator of Ovid, Juvenal, and other classics, Vaughan died April 23, 1695. A study by F. E. Hutchinson appeared in 1947.

Vaughan, HERBERT ALFRED (1832-1903). British cardinal. Born at Gloucester, April 15, 1832, he was the eldest of eight brothers. He was educated for the priesthood at Stonyhurst and in Belgium, Paris, and Rome. Ordained in 1854, he became vice-principal of S. Edmund's College, Ware, and was for three years head of a missionary college at Mill Hill before becoming bishop of Salford in 1872. In 1892 he became archbishop of Westminster, and next year a cardinal. He died June 19, 1903. His great work was the erection of the cathedral at Westminster (*q.v.*).



Herbert Vaughan,
British cardinal
Downey



Charles Vaughan,
British divine

Vaughan, KATE (1852-1903). British actress, whose real name was Catherine Candelon. Born in London, she made her debut as a dancer in 1870, first appearing as an actress in 1872. During 1876-83 she was acting in burlesque at the Gaiety Theatre, and in 1886 organized, with H. B. Conway, the Vaughan-Conway comedy company. Her health failing, she went to Australia, 1896, and S. Africa, 1902, dying at Johannesburg, Feb. 21, 1903.



Kate Vaughan,
British actress
Downey

Vaughan Williams, RALPH (b. 1872). English composer. This son of a clergyman was born



Vaughan Williams,
English composer

Oct. 12, 1872, at Down Ampney, Glos, and went from Charterhouse to Trinity College, Cambridge, taking his music degree in 1894; he studied further under Stanford and Parry at the R.C.M. and under Bruch in Berlin. Joining the Folk-song Society in 1904, he travelled round England collecting folk tunes, their influence being shown in three Norfolk rhapsodies and the ballad *Linden Lea*. He emerged into prominence with a choral work, *Toward the Unknown Region* (1907), to words by Whitman. There followed the song-cycle, *On Wenlock Edge* (1909), from Housman's verse; and next year the Sea symphony. A stirring tune was written for the hymn *For All the Saints*; and incidental music for Aristophanes's comedy *The Wasps*.

He had already shown that mastery of counterpoint and fondness for modal polyphony which were never to desert him. To these qualities and a gift of melody of a peculiarly English type he added in the London symphony (1914) occasional cacophony to represent street noises, which brought the work some criticism. After war service Vaughan Williams was chosen teacher of composition at the R.C.M., conductor of the Bach choir, and director of the English folk-dance society. In the 1920s came his Pastoral symphony; an opera, *Hugh the Drover*; Mass in

G minor; Flos Campi, an orchestral suite; and a violin concerto. Sir John in Love (1930) was a light opera based on The Merry Wives of Windsor; it contains the beautiful setting of Greensleeves.

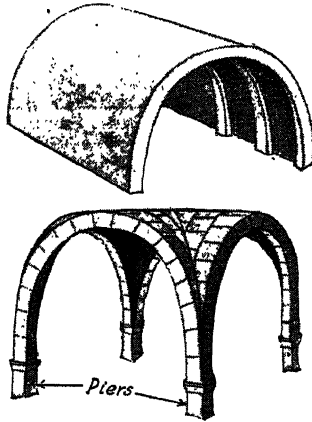
Development of a deeply religious mind that yet was fully aware of strife in the world was expressed in ballet music for Job; the exquisite fantasia for strings on a theme of Tallis; another choral work, Benedicite. Award in 1935 of the O.M. underlined the general feeling that the deaths of Elgar, Delius, and Holst had left Vaughan Williams without an equal in English music. That year Italy invaded Abyssinia, and of his violent fourth symphony the composer remarked, "I don't know if I like it, but that's what I meant to say." For Wood's jubilee as a conductor he produced a Serenade to Music of unearthly beauty. Later works showing his interest in various instruments were a suite for viola and orchestra, oboe concerto, and two-piano concerto. He wrote music for the film 49th Parallel. In the fifth symphony (1943), with its unparalleled close, many heard the summing-up of a whole spiritual journey; the work was suggested by passages from Bunyan, and dedicated to Sibelius. In 1948 his sixth symphony was performed; in 1950 Folk Songs for the Four Seasons (written for the Women's Institutes) and a concerto grosso for strings (for the Rural Music Schools' Association). Consult R.V.W.: a Study, H. Foss, 1950.

Alan Phillips

Vault (Lat. *volvere*, to roll). Literally, an arched roof. It is also a chamber with such a roof and, as these are often underground, the word has come to be used for cellars where wine is stored. Architecturally, the earliest form was the barrel vault, shaped like the upper section of a rly. tunnel. This was invented by the Persians; later the Romans discovered how to construct the groined vault by intersecting two barrel vaults at right angles to each other, the groin being the angle formed by the meeting of the two surfaces. This method was used in Norman building until the introduction of the ribbed vault.

In the groined vault the solid construction required a great weight of masonry, which had to be carried by a proportionately heavy supporting wall; but the ribbed vault was constructed by means of a series of narrow stone arches crossing each other diagonally, and so

forming a framework for the arch, the intervening spaces being then filled up, with comparatively light



Vault. The Roman groined vault, formed by intersecting two barrel vaults, top. See text

webbing, so as to complete the roof. During the 13th century the number of ribs was increased; in the 14th, important modifications were made in their curvature; in the 15th the pitch of the vault was reduced, and the ribs again grew more numerous, and the spaces between them narrower. This led to the introduction of cross ribs to divide their length, and to the formation of lierne vaulting, whence sprang fan-tracery (*q.v.*) vaulting, climax of Gothic skill. See Architecture; Gothic Architecture; Tomb.

Vaupés or **VAPES**. Commissary of Colombia. It is drained by the Guaviare, Inirida, Vampés, and Apaporis rivers, and lies E. of the Andean Cordillera, touching Venezuela and Brazil on the E. Area, 57,842 sq. m. Pop. est. 7,830.

Vauquelin, **LOUIS NICOLAS** (1763-1829). French chemist. Born

at St. André d' Hébertot, Normandy, May 16, 1763, he went to Paris as an assistant in pharmacy, and later became laboratory assistant to Fourcroy. He was inspector of the mint and professor of applied chemistry to the museum of natural history. Vauquelin first isolated chromium and beryllium, and made an accurate analysis of carbon disulphide, lithium, cyanogen, allantoin, and the hyposulphites. In 1802 he was made a member of the legion of honour, and he died Nov. 14, 1829.

Vauxhall. District of London. On the Surrey side of the Thames, W. of Kennington, with a rly. station, it is in the bor. of Lambeth (*q.v.*), and returns an M.P. It was originally known as Faukeshall, or Fulke's Hall, after a Norman knight, Fulke de Bréauté, who owned the manor in King John's time. In its manor house, later called Copped or Copt Hall, Lady Arabella Stuart was a prisoner.

Vauxhall became famous for its gardens, a popular resort for about 200 years. Laid out in Charles II's time, and at first called New Spring Gardens, to distinguish them from the gardens near Charing Cross, and referred to by Pepys and the Restoration dramatists, also described by Dickens, Thackeray, and other writers, they were finally closed, July 25, 1859. Vauxhall Park, 8 acres, was opened in 1890; Vauxhall Bridge, connecting with Millbank (*q.v.*), in 1906, in place of one that dated from 1816. Ambrose Phillips and Henry Fawcett were residents. The first Rowton House (*q.v.*) was opened here in 1892. Pop. 29,056.

Vavasor (old Fr. *vavassour*, from medieval Lat. *vassus vassorum*, vassal of vassals). In the feudal system, a term applied to various kinds of vassals, sometimes for a



Vauxhall. Scene in the fashionable pleasure gardens when they were at the height of their fame. From a drawing by Rowlandson

class below barons or tenants-in-chief, and above knights. See Feudalism.

V Campaign. Campaign of symbolical resistance against the German occupier carried out in Europe during the Second Great War. It was started by Victor de Laveleye, a member of the Belgian parliament who escaped to England and, joining the B.B.C. as an announcer, suggested in a broadcast to Belgium during Jan., 1941, the chalking on

walls of the letter V for *vrijheid* (freedom in Flemish and Dutch). The idea was taken up by "Colonel Britton" (*q.v.*), who broadcast regularly to Europe in English. Under his influence and with the added implication of victory in English, *victoire* in French, the use of the V signal spread to France, the Netherlands, Norway, Denmark, Czecho-Slovakia, and Poland, causing so much alarm to the Germans that they attempted to adopt the symbol as their own, asserting that it stood for the "old German word *Viktoria*" (*Sieg* being German for victory). They inflicted severe punishments for its use, described by them in the Netherlands as "satanically inspired devilry." A Britton broadcast at midnight on July 20-21, 1941, followed by a message from the British premier Churchill, gave the movement immense fresh impetus. It took two forms—painting of Vs on walls, pavements, doors, public vehicles, etc., and the tapping out or humming of the morse code V (three dots and a dash). The opening bars of Beethoven's Symphony No. 5 (V), which are in the rhythm of the morse V, were adopted as signature tune for the B.B.C.'s European broadcasts in English; and Churchill greeted admirers everywhere by raising his hand with the first and second fingers spread wide in the shape of a V. The campaign was kept up in the occupied countries until liberation during 1944-45.

Veddar. Month of the Jewish calendar intercalated at leap year. The ordinary year consists of 12

lunar months, making 354 days. To ensure that Passover, the 15th day of Nisan, shall occur at the full moon of the spring equinox, an adjustment is made by introducing a leap year, of 384 days, seven times in each period of 19 years. In the leap year an additional day is added to the month Adar, and the remaining 29 days form the month Veadar (double Adar), which is intercalated between Adar and Nisan, thus becoming the 7th month of the civil and the 1st of the eccles. year. See Calendar.

Veal (old Fr. *veël*). Flesh of the calf prepared as food. Good meat is pale in colour, firm and closely grained, and the fat white. It should be eaten fresh.

Vecht. Name of two rivers of Europe. (1) The Vecht or Vechte rises near Billerbeck, Westphalia, Germany, and with a generally W. course enters the Netherlands near Gramsbergen, flowing into the Zuyder Zee (Yssel Meer) near Genemuiden. It is navigable up to Sohüttorf, Hanover, receives as tributaries the Aa, Dinkel, and Regge, and is linked by canals with the Ems and other waterways. Length, 90 m. (2) The Vecht (prov. of Utrecht, Netherlands) is a division of the lower Rhine, which branches at Utrecht into the Vecht and Old Rhine. It drains N.W. and N. into the Yssel Meer. Its length is 20 m.

Vector (Lat., carrier). In mathematics any quantity involving direction and magnitude. Such a quantity is usually represented by a line with an arrow. Vector quantities in physics are those which can be represented by a vector. Examples are linear velocities, and forces acting on a body. Vectors can be compounded by the parallelogram law of mechanics. Vector analysis is that branch of mathematics concerned with the properties of vectors; this is of particular use in physics, *e.g.* the electro-magnetic theory.

Vedas (Skt. *veda*, knowledge, *c.f.* Eng. *wit*). Oldest sacred literature of the Hindus. Written in Sanskrit, they are regarded as having been the work of poets who lived between 2000 and 1000 B.C. They are divided into the Rig-Veda, Yajur-Veda (prayers), Sama-Veda (hymns for sacrificial occasions), and Atharva-Veda. See Brahmanism, Brahma Samaj; Hinduism; Rig-Veda; Sanskrit.

V.E.-day. Popular name given to May 8, 1945. This was the date on which victory in Europe in the Second Great War was assured to the Allies. The German high com-

mand having signed at Reims an unconditional surrender of all fighting forces on May 7, this was confirmed in Berlin on May 8. May 8 and 9, 1945, were, except in essential industries, national holidays in the U.K.

Vedda. Primitive people in Ceylon. Numbering some 5,000, they are scattered over an area E. of the Mahawale Ganga river, comprising the E. prov., one-fifth of Uva, and a corner of the N. Central prov. Of Caucasoid stock, they are dark-brown, wavy-haired, long-limbed, long-headed, 5 ft. $\frac{1}{2}$ in. in height. They consist of forest Veddas, still preserving the primitive culture; village Veddas, who have intermarried with the Sinhalese and practise rude agriculture; and coast Veddas, dwelling for the most part N. of Batticaloa, who display Tamil admixture. Descended from the Yakkas, recorded in the 6th century B.C., they are probably immigrants from pre-Dravidian India, and were preceded by a Palaeolithic people known only by their chipped stone implements.

Vedette (Lat. *videre*, to see). French military term adopted in English and other languages. Strictly a vedette is a mounted sentinel placed in front of the pickets to warn them of the approach of an enemy. The word is also used for a small boat used for a similar purpose.

Vedrenne, JOHN EUGENE (1867-1930). British impresario. He was born July 13, 1867, and, leaving a commercial career, became business manager to various London theatres. In 1904 he took the Court Theatre, where, in partnership with Granville-Barker (*q.v.*), he put on striking productions, including plays of Euripides and Bernard Shaw. The partnership ended in 1907, and Vedrenne became associated with Lewis Waller at the Lyric Theatre. He was with Dennis Eadie at the Royalty, 1911-19, and then lessee of the Little. He died Feb. 12, 1930.

Veering. Term applied to the wind when it is changing in a clockwise direction in either hemisphere, *i.e.* N.-E.-S.-W.; when the change is in the opposite direction the wind is said to back. In the N. hemisphere the winds at a place to the N. of a westerly depression generally back from S.E. through E., when the centre of the depression is due S., to N.E. and N. as it passes away. South of the track of the depression the winds veer from S.E. to W., when the centre is due N., and finally



V Campaign. The V sign, being given by Winston S. Churchill, who frequently greeted admirers with this symbol of ultimate victory during the Second Great War

to N.W. In the S. hemisphere the winds around a system of closed isobars are in the reverse direction; hence there the wind will veer where it would back in the N. hemisphere, and vice versa. The wind may veer or back with increase in height above the earth's surface. See Buys-Ballot's Law.

Vega. The brightest star of the N. hemisphere. It is the first star, Alpha Lyrae, in the constellation of the Lyre. A very white star, at a temp. of about 15,000° C., its parallax is 0.124 secs., and it has a brilliancy equal to that of 50 suns. It will be the Pole Star between A.D. 13,000 and 15,000.

Vega Carpio, LOPE FELIX DE. Spanish poet and dramatist. See Lope de Vega.

Vegetable. In its narrow, everyday use, word indicating any herb that is cultivated specially for table use in whole or part, such as turnip (root), cabbage (leaves), broccoli (flowers), peas and beans (fruit). All the common vegetables are in this work dealt with separately. In its widest sense the term vegetable includes all living things that are not animals—trees, shrubs, herbs, ferns, mosses, seaweeds, fungi, and the microscopic diatoms. Separate articles under these heads should be consulted.

The unit of structure, the cell, is essentially the same in both animals and plants, but the combination of the cells into tissues and organs shows marked differences in the two forms of life.

All animals depend for their food upon material originally elaborated by plants. The green plants alone have the power to construct the basic food material from elemental substances, and physiological processes different from those of animal assimilation are rendered necessary. The fungi (*q.v.*) approach the animals in this respect; they must feed upon material that has already done service as part of the structure of other plants or of animals. The fine divisions of roots explore the soil in search of water in which are dissolved the salts of sodium, iron, potassium, phosphorus, calcium, sulphur, etc. The hairs with which the rootlets are clothed absorb this fluid by osmosis, and it is passed upward through the long vessels of the wood bundles until it reaches the cells of the leaf. These cells contain green bodies (chloroplasts) in their protoplasm, and it is the chlorophyll that imparts the green colour to leaves and soft shoots. In the leaf-skin (epidermis) there

are innumerable pores or stomata through which surplus water from the roots is evaporated and through which atmospheric air is admitted to the spaces between the leaf-cells.

The chloroplasts in these cells have the power by what is known as photosynthesis to utilise solar energy in decomposing the carbon dioxide of the air, and the cells retain the carbon, setting free the oxygen. Water from the roots is also broken up into its elements, hydrogen and oxygen, and with these plus carbon starch is formed. This, converted into grape sugar, is passed from cell to cell (*see* Phloem) to parts of the plant where it is needed for the production of new cells, wood, bark, leaves, or fruit. Starch is the material from which all the organic substances produced by the plant are built up.

The surplus over present requirements is stored up as reserves, in seeds, enlarged roots or stems, bulbs, or tubers for renewed growth or floral display at a later season. Waste products are converted into resins, oils, wax, or alkaloids—many of these being of considerable economic value to man. Part of the water stream from the roots passes by osmosis from cell to cell, where it is necessary in order to keep the protoplasm in an active condition; any insufficiency is followed by a flagging of the tissues, the drooping of leaves and young shoots. In addition to the absorption of carbon by the protoplasts for building purposes, the leaf-cells also take up oxygen from the atmosphere and give off carbon much as animals do.

As the plant respires without lungs and assimilates without digestive organs, so also it can effect movements without a muscular system and react to external stimuli without a nervous system. It is sensitive to light and heat; many plants have distinct night and day positions for their leaves. It responds positively and negatively to the force of gravity, the root going down into the earth and the stem rising into the air. The growing tip of a stem or shoot commonly nutates, *i.e.* moves from side to side or in a circle or ellipse. The plant can orientate itself, *i.e.* take up a definite position in re-

gard to the incidence of light or other external stimulus. These movements appear to be controlled largely by alterations in the position of the mobile chloroplasts.

The reproductive process is, in essentials, similar to that of animals, the ovules or seed-eggs in the ovary requiring to be fertilised by male sperms represented by the pollen grains produced in the anthers. The result of such fertilisation is to cause the ovule to develop into an embryo capable of further development under suitable conditions into a plant resembling the parent. *See* Botany; Market Gardening; Plant.

Vegetable Ivory OR NEGRO'S HEAD (*Phytelphas macrocarpa*). Small tree of the family Palmac also known as Ivory Nut (*q.v.*).

Vegetable Marrow (*Cucurbita pepo*). Annual creeping or bush plant, bearing edible fruits,



Vegetable Marrow. Round fruited Tender and True bush variety of the marrow

By courtesy of Sutton & Sons

of the family Cucurbitaceae. It grows in any ordinary rich soil. The flowers, in which the sexes are separate, are best fertilised by means of a camel-hair brush. Marrows are raised from seed sown in a greenhouse temperature in spring, and planted out in the summer. Much application of water is necessary after the fruit is set, in order to make it swell to a good edible size. Unless plenty of ground is available with a sufficiency of rich, well-decayed manure, the cultivation of bush marrows is not recommended from an economic point of view. *See* Cucurbitaceae; Gourd.

Vegetarianism. Name given to the movement which aims at making vegetable foods the sole diet of human beings. It began about 1850, and its followers abstain from eating the flesh of animals and birds. Some eat fish, but others do not, while the strictest vegetarians abstain from all food which comes from animals, such as eggs, milk, butter, and cheese.

One reason for vegetarianism is the dislike of inflicting pain, but it is also advocated as providing a more nourishing and economical diet. It is also claimed that a vegetarian diet makes persons less liable to certain diseases, *e.g.* cancer, and less gross in their appetites and desires, while it is also advocated on economic and patriotic grounds. Akin to the vege-

tarians are the fruitarians, who maintain life solely on a diet of fruit.

In the 19th century the movement made much progress in Great Britain, the U.S.A., and several European countries. Vegetarian restaurants were opened in large towns, and other measures taken to popularise vegetarian dishes. Societies exist for the promotion of vegetarianism, and several periodicals are published in its interests. *See Diet; Food.*

Vegetation (Lat. *vegetare*, to quicken). General term for plants growing in a locality, but applied mainly to trees, shrubs, herbs, and ferns with green foliage. It cannot properly be limited in this way, but must be understood as embracing all plants—including mosses, seaweeds, etc. *See Botany; Ecology.*

Vegetius Renatus, FLAVIUS (c. A.D. 375). Roman writer on war. His *Epitome of the Institutes of Military Science*, though not original, but consisting largely of excerpts from the works of other military writers, was regarded during the Middle Ages as the great authority on the art of war.

Veglia. Italian name of the Yugoslav island whose native name is Krk. In the Adriatic Sea, it was formerly part of the Austrian crownland of Istria. It is separated from the Croatian coast by the narrow channel of Morlacca, and is 23 m. long by 12 m. wide. Marble is quarried, livestock reared, and there are extensive fisheries. Krk (or Veglia), on the W. coast, is the capital.

Veii. Ancient city of Etruria. On the Cremera, it was about 10 m. N. by W. of Rome. Probably the most powerful of the 12 Etruscan cities, it was in constant enmity with Rome, and was finally taken by the Romans under Camillus in 396 B.C. after a siege, it is said, of ten years. After the sack of Rome by the Gauls in 390, there was a proposal, overruled by Camillus, that the Romans should give up their city and settle in Veii. In rock tombs archaeologists have discovered examples of Etruscan paintings of the earliest period.

Veil (Old Fr. *veile*, from Lat. *velum*, cloth). Article of feminine dress, used as a covering for the head, especially the face. In the ancient world, as in the Indian subcontinent today, a mantle wrapped round the head was, when so desired, drawn over the face as a veil. In some Mahomedan countries, but not among the nomadic Arabs, custom requires the veiling of women in public or in the presence

of men. The Turkish yashmak veils the face from below the eyes.

In the R.C. church a woman admitted into a religious order takes the white veil of reception on entering her novitiate. When she is fully professed and takes the nun's life vows, she receives the veil of profession, usually black, though in some orders it is white.

Vein. Vessel by which venous blood—i.e. blood which has parted with its oxygen, passed through the capillaries, and picked up waste material from the tissues—is conveyed back to the heart. The walls of veins are thinner than those of the arteries, but, like the latter, consist of three coats. Veins differ also from the arteries in possessing valves so disposed as to prevent the blood from flowing in the reverse direction. The veins from the legs and lower part of the body all pass eventually into a main trunk, the inferior vena cava, and those from the arms, head, and upper part of the body into another main trunk, the superior vena cava, both of which open into the right auricle of the heart.

Phlebitis is inflammation of a vein, and is often associated with thrombosis. The vessel becomes swollen, painful, and hard, and dropsy of a limb may arise because the forward passage of the blood is prevented. Infective phlebitis is a serious condition in which microorganisms are present in the thrombosis, and may give rise to general blood poisoning with formation of abscesses in various parts of the body. In simple phlebitis, the limbs should be kept completely at rest in order to lessen the risk of detachment of emboli. Belladonna fomentations may be applied. The patient should be kept in bed until all inflammation has subsided, and time has been given for the clot to become organized, i.e. converted into fibrous tissue, which is not likely to be displaced. It is usual to allow not less than 6 weeks for this process. In infective phlebitis, when suppuration has occurred, the abscess should be opened without delay. *See Anatomy; Artery; Blood; Thrombosis; Varicose Veins.*



Vein, greatly enlarged, showing pocket-like valves

Vein. In geology, a mineral deposit in fissures and cracks of rocks. Such mineral ores have usually been deposited from solutions, and may be metallic or non-metallic; the two kinds are usually found in veins together. The non-valuable mineral deposit in a vein is known as the gangue. Veins are sources of many valuable metals, e.g. gold and silver, and vary in size from the almost invisible to several hundred feet in thickness. *See Dyke; Gangue; Lode.*

Veining. Metallurgical term describing the faint network of oxide that sometimes forms within metal crystals on cooling. The oxide is precipitated in this form when the solubility of oxygen in the solid metal decreases with falling temperature. It may be removed by high temperature annealing in a suitable reducing atmosphere, or by cooling rapidly from a high temperature.

Vejer de la Frontera. Town of Spain, in the prov. of Cadiz. It stands on the river Barbate, 6 m. N.E. of Cape Trafalgar, and has a pop. of 16,000. Here in 711 Rodrigo, last king of the Visigoths, was defeated by Moorish invaders.

Vejle. Seaport of Denmark, in Jutland. It is in a hilly and forested district, at the mouth of a river and the head of a fjord, all of which have the name Vejle. The town is a rly. junction 16 m. N.W. of Fredericia. Many of the pop. of 27,107 depend on the fisheries.

Velazquez (OR VELASQUEZ) DE CUÉLLAR, DIEGO (1465-c. 1522). Spanish administrator. Born at Cuéllar, near

Valladolid, he sailed with Columbus on his second voyage, and in 1511 conquered Cuba, of which he became governor, founding several towns, and remaining there until his death. Velazquez was responsible for an expedition which discovered Yucatan in 1517, and sent Cortés to Mexico next year. Regretting, however, the extensive powers he had given to Cortés, he sent a force under Panfilo de Narváez, which was overthrown by Cortés, 1520.

Velazquez OR VELASQUEZ, DIEGO RODRIGUEZ DE SILVA Y (1599-1660). Spanish painter. Born at Seville, June 6, 1599, his early days as an artist were passed with Francisco Herrera, whose fiery temper soon drove him to a more



Diego Velazquez, Spanish administrator

congenial teacher, Pacheco, an excellent master, though not a clever painter. He appreciated the genius of his pupil, and gave him his daughter Juana as wife. Velazquez also came under the influence of Luis Tristan, a pupil of El Greco. Settling in Madrid in 1623, he there painted a portrait of Fonseca, almoner to Philip IV, which introduced him to the notice of the king. In the same year he painted a portrait of Philip IV, the first of a very long series which he painted of that king at every period of his life.

In 1628 Velazquez met Rubens, who came to Madrid as ambassador from the regent of the Netherlands. Having then conceived an eager desire to visit Italy, he left Spain, 1629, journeying to Venice, and then to Rome, by way of Ferrara and Bologna, and in 1630 was in Naples. The next year saw him back again at Madrid, and from that time began his long series of notable portraits.

His second visit to Italy was paid in 1649, when his main object was to collect pictures and casts from the antique. On this occasion he painted his celebrated portrait of Pope Innocent X. In 1651, home again in Spain, he was given a high court appointment by the king, which took up much time. His pictures at this period include Maids of Honour, and the Tapestry Weavers. He died in Madrid, Aug. 6, 1660.

The main feature of the art of Velazquez is its absolute fidelity to visual truth. He was an impressionist in the truest meaning of the word, could seize upon an effect in its momentary force, and represent it in all its bare truth, painting colour as it really was. He had an unequalled command of tone values. There is never any false lighting or inaccurate incidence of light in his pictures, and he not only understood atmosphere, but grasped the mystery of shadows and darkness. He selected essentials with unerring judgement, and no other works are more near than his to the effect of nature, or produce more effectively the true perspective of the atmosphere.

His work can be properly studied only in Madrid, where there are at least 46 undoubted pictures. Other fine works are in London, in the National Gallery, notably his only important nude, Venus and Cupid. Several of his finest portraits are in Vienna, the Louvre, and in Russia, Holland, and Germany, but without proper study of his subject groups, especially the Surrender of Breda, The Maids of

Honour, and The Tapestry Weavers at Madrid, the nobility and greatness of Velazquez cannot be understood. *Consuli* Life, Sir W. Stirling-



Diego Rodriguez de Silva y Velazquez
Self-portrait in the Uffizi Gallery, Florence

Maxwell, 1855; and the complete Phaidon Press edition of paintings and drawings by V., 1944.

Veld (Dutch, field). The extensive, open, temperate grasslands of the plateau of S.E. Africa. In the wetter parts, towards Basutoland and the Drakensberg Mts., agriculture is possible, but pastoral pursuits are more important in the drier parts. *See* Steppes.

Vélez. Town of Colombia, in the prov. of Santander. It is on the Suarez river, 103 m. N. of Bogotá. Dating from 1539, Vélez was the second city founded in New Granada.

Vélez-Málaga. A seaport of Spain, in the prov. of Málaga. It stands on the left bank of the river Vélez, 1 m. from the Mediterranean Sea, and 19 m. by rly. E. of Málaga. To its strategic situation, which earned it the title of the Key of Andalusia, it owes its Moorish citadel. The Moors held the town from 711 until its capture in 1487 by Ferdinand of Castile. Its most famous edifice is the church of San Pedro. Raisins, sugar, and olive oil are products. Pop. 25,300.

Velia or **Elea**. Ancient Greek colony on the W. coast of Campania, S. Italy. It was founded by Phocaean from Corsica in the 6th century B.C., and is chiefly known as the name-place of the Eleatic school (*q.v.*) of philosophy. There are remains of the town at Castellammare della Brucca, 25 m. S.E. of Paestum.

Velia was also the name of a hill between the Palatine and the Esquiline, surmounted by the arch of Titus.

Velikii Luki. Town of the R.S.F.S.R., capital of the region

of the same name. It lies 132 m. S.E. of Pskov, on the banks of, and on an island in, the river Lovat, which flows into L. Ilmen. Mentioned as part of the republic of Novgorod in 1166, it was destroyed in the course of subsequent civil wars, but reconstructed by Tsar Michael Feodorovitch in 1619. It had remains of a moat and earth walls constructed at the time of Peter the Great. There were tanneries and boot and candle factories. Captured by the Germans, Aug. 26, 1941, it was turned by them into a strong "hedgehog" defence point, and was recaptured Jan. 1, 1943, by Russian forces, including Uzbeks and Kazakhs from central Asia, only after fanatical fighting for every "pillbox," house, and street. Gen. Scherer, on Hitler's orders, having announced that reprisals would be taken on the family of any soldier who surrendered, the German garrison was killed to the last man.

Velino. River of Italy. It rises in Mt. Velino, in the Central Apennines, and flows N.N.W. past Rieti to join the Nera, an affluent of the Tiber, near Terni, after a course of 54 m., part of which divides the depts. of Abruzzi and Latium. The celebrated Falls of the Velino, called the Marble Cascades, consist of three leaps of 30, 300, and 190 ft. *See* Terni.

Vellala. Indian caste of farmers in the Tamil country. Numbering about 2,500,000, almost wholly in Madras and Travancore, besides a considerable number of emigrants to Ceylon, they are a long-headed, frugal, industrious, and peaceable people. Traditionally descended from Vaisya cultivators who came from the N. into the ancient Pandya kingdom, they are the chief Tamil-speaking caste-Hindus.

Velletri. City of Italy, in the prov. of Rome. It is situated on the slopes of the Alban Hills, 26 m. by rly. S.E. of Rome. The 17th century cathedral of San Clemente is the seat of a cardinal-bishop. The Palazzo Ginatti has a fine interior. Wine is the chief product. Known as Velitrae, the city was captured from the Volscians by the Romans in 338 B.C. Garibaldi gained a victory over the Neapolitan forces here in May, 1849. Pop. 26,000.

Velletri and Valmontane 10 m. to the N.E. were main bastions of Kesselring's "Rome line," covering the capital, during the Second Great War. Both were captured by U.S. forces June 2, 1944, after a week's heavy fighting. The

vineyards around Velletri were full of German snipers who had to be put out of action in detail. Both Velletri and Valmontane were severely damaged, and in both the German troops had looted many portable objects of value.

Vellore. Town of Madras state, India. In the div. of N. Arcot, 75 m. W. by S. of Madras, it is situated on the Palār river and joined by rly. to Pondicherry. Here are a celebrated fort and temple, and a medical college established by British and American missionaries. Pop. 71,502.

Vellum (Old Fr. *velin*, from Lat. *vitulinus*, of a calf). Fine kind of parchment, made from the skins of calves or kids, and given a smooth finish. The once celebrated Strasbourg vellum was prepared with remarkably fine pumice stones. Vellum, known since earliest times as a material for MSS. and books, is now chiefly used for bookbinding. See Book-binding; Parchment.

Velocipede (Lat. *velox*, swift; *pes*, foot). Early form of bicycle. Originally a development of the draisine, a two-wheeled machine propelled by thrusting the feet against the ground, it was improved by a Frenchman named Michaux and fitted with cranks and pedals on the front wheel. The machine was also known as the boneshaker in England.

Velocity. Rate at which a point or particle changes its position. The change in the position of a particle must have both magnitude and direction, so that velocity is a vector (*q.v.*) quantity. It may vary both in regard to its magnitude and to its direction, and its magnitude may be constant while its direction continually varies, as when a train goes round a curve. To measure a particle's velocity, two things must be determined; (a) the space over which the particle has moved in a given time; (b) the change of direction of motion during this time. Hence, if a particle moves in a straight line and so preserves a constant direction, and passes over equal spaces in successive equal times, its linear velocity is said to be constant. If, however, it is moving in a circle, say, and passes over equal arcs in equal times, its speed is constant, but its linear velocity is not. Constant speed is measured by dividing the space passed over in any given time by that time. Unit speed is such that unit space is passed over in unit time.

The unit of velocity is that velocity with which a point passes over

unit length in unit time, *e.g.* one foot per second.

Angular velocity is angular speed round an axis. To define it fully, a straight line must be given in length, direction, and position, and is known as a rotor or localised vector. See Speed.

Velour (Fr., velvet). Fabric used for various purposes. Similar to felt, but having a pile like velvet or plush, it is made of linen and double cotton warps with weft of mohair yarn, and is used chiefly for hats and in upholstery. See Cloth; Hat and Hat-making.

Velvet (Ital. *velluto*, from Lat. *villosus*, shaggy). Fabric with a short thick silk pile. The back is today usually of cotton. Velvet was possibly first made in the Far East, and seems to have been unknown in Europe until the end of the 13th century or the beginning of the 14th. The finest velvets came from Italian looms, especially from Genoa, Florence, Milan, Venice, and Lucca; and the velvets of Spain and Flanders, notably from Bruges, were also famous. France learned the art of velvet-weaving from Italy, and at the revocation of the Edict of Nantes, in 1685, the French Protestant refugees brought it to Spitalfields, London. Perhaps the finest effect is that known as "velvet on velvet," where rich patterns are formed by a long pile on a shorter pile. The "cut velvet" of Japan is marked by consummate delicacy of design and craftsmanship. The old custom of improving the set of velvet by stiffening it with gum, which soon wore out the fabric, explains such allusions as that to Falstaff's horse, which is described by Poins as fretting "like a gummed velvet." Downy skin on the antlers of growing deer is called velvet.

Velveteen. Pile fabric resembling velvet, but usually with a cotton or rayon pile instead of silk. Further, in velvet the warp threads form the pile, whereas in velveteens the weft threads usually do so. Some velveteens are ribbed, and resemble corduroys or Bedford cords.

Vemork. Village of Norway. Situated in the Rjukan valley, in Telemark co., it contains the Norsk Hydro hydrogen electrolysis plant which in the Second Great War was the only considerable source in Europe of heavy water used by the Germans for experiments in atomic energy. In 1942 three Allied attempts were made to sabotage the plant by dropping demolition parties by parachute, but none was successful. On Feb. 27, 1943, a Norwegian party was

dropped near the plant, and after overcoming the German guards destroyed the high concentration equipment together with 3,000 lb. of heavy water (*q.v.*). In Nov. a raid by the U.S.A.A.F. decided the Germans to dismantle the installation and send it to Germany.

Vendavales. Name given to the strong, squally S.W. winds which blow in the Straits of Gibraltar and off the E. coast of Spain. These winds, bringing rough weather and heavy rain, are associated with the passage of depressions, chiefly between Sept. and March.

Vendée. Dept. of France. Formerly the prov. of Bas-Poitou, it lies contiguous with the depts. of Loire-Inférieure, Maine-et-Loire, Deux-Sèvres, and Charente-Inférieure, and is bounded W. by its low, sandy Atlantic seaboard. The dept. includes the islands of Noirmoutier and Yeu. The surface is generally flat, with low hills to the E. The central part, known as the Bocage, is wooded, and the marshy tracts to the S. are fertile. Vendée is largely agricultural; wheat, oats, potatoes, flax, and colza are grown, and cattle and sheep are reared in the S. The Vendée, Yon, Lay, Vie, and reaches of the Maine and Sèvre are among the many rivers. The capital is La Roche-sur-Yon, other towns being Fontenay-le-Comte, Montaigu, St. Gilles, Les Sables d'Olonne, Luçon, and Sta. Hermine. The dept.'s area is 2,690 sq. m. Pop. 393,787.

Vendée, RISING IN. Episode of the French Revolution. In 1793 conscription was introduced by the republican govt., and the Royalist peasantry in Vendée, with some sympathisers in Anjou, Maine, Poitou, and Brittany, broke out into open revolt. Several *émigré* nobles joined them, and military successes were gained over inefficient republican generals, but eventually the Vendéans were beaten at Cholet (Oct. 16) and crushed at Savenay (Dec. 23). A conciliatory policy was then applied by Hoche, representing the Convention.

Vendémiaire. First month in the year as rearranged during the French Revolution. The month of vintage (Lat. *vindemia*), it began on Sept. 22 or 23, the opening of the Republican year.

Vendetta (Lat. *vindicta*, vengeance). Form of blood feud (*q.v.*), by which the privilege and duty of avenging the death of a murdered person rests primarily upon the next of kin. The term is specifically applied to the practice in S.

Italy, and still more particularly to the Corsican vendetta. This last was at its climax during the closing decades of the 18th century, when about 7,000 murders are said to have been committed in the island. If the next-of-kin fails in his duty by the dead, his relatives take up the vendetta, which may spread with disastrous effects, since, if the murderer succeeds in eluding his pursuers, vengeance may be taken on his relatives, and family feuds may thus be perpetuated. The term is also used figuratively of any private quarrel in which persistent vindictiveness is shown.

Vendôme. Duchy of France. The former county of Vendôme was raised to a duchy by Francis I in 1515 in favour of Charles de Bourbon (d. 1536). The duchy was held by, among others, César de Bourbon (1594-1665), natural son of Henry IV by Gabrielle d'Estrées, legitimised in 1595, who was known as a general in the Huguenot wars, 1621, and imprisoned for conspiracy, 1626-30. An ally of Mazarin, he became governor of Burgundy, 1650, fought for the royal army in Guienne, 1653, and defeated the Spanish fleet off Barcelona, 1655. His grandson, Louis Joseph, duke of Vendôme, is noticed separately. This line became extinct in 1727.

Vendôme. Town of France, in the dept. of Loir-et-Cher. It lies on the Loir, 42 m. by rly. N.E. of Tours, and is a rly. junction. There is trade in agricultural produce, and industries in leather dressing, glove making, and paper making. The church of the Trinity, formerly an abbey church, dates from the 12th to 15th centuries. There are remains of the 10th century château. Vendôme was captured by the Prussians, Dec. 16, 1870. Pop. 10,315.

Vendôme, Louis JOSEPH, Duc de (1654-1712). French soldier. He was born in Paris, July 1, 1654,

the great-grandson of Henry IV. His military career began in the Dutch campaign in 1672, and he subsequently fought in Germany, Alsace, the

Low Countries, and Italy. In 1695 he commanded the army in Catalonia, and crowned a brilliant campaign with the capture of Barcelona in 1697. During the War of the Spanish Succession he first fought in Italy, and

in 1706 defeated the Austrians at Calcinato. Transferred to the Low Countries, he lost the battle of Oudenarde to Marlborough in 1708, and was relieved of his command. He retrieved his reputation in Spain, where he was sent in 1710 to assist Philip V against the British and the Austrians, defeating the former at Brihuega and the latter at Villa Viciosa. Probably the best French commander after Villars, he died June 11, 1712.

Vendor. In law, a person who sells to another, called the purchaser, at a price in money, any property. When goods are the subject of the sale, the parties are more properly called buyer and seller; and the terms vendor and purchaser are reserved for transactions in other kinds of property.

Veneer (Ger. *furnieren*, to furnish). Thin sheet of ornamental wood glued over inferior wood. Such sheets may be as thin as paper, and enable a rich effect to be obtained at a reasonable cost. Most contemporary wooden furniture of medium price (e.g. walnut, dark oak, the "Empire" woods) is veneered. See Inlaying; Marquetry.

Venereal Disease. Term covering several otherwise unrelated diseases conveyed from one person to another by sexual intercourse and rarely by any other means. The diseases comprise clap or gonorrhoea (*g.v.*), pox or syphilis (*g.v.*), soft sore or chancroid (*see* Chancre), "non-specific" urethritis, and certain other conditions caused by viruses or specific micro-organisms. Other conditions sometimes conveyed during intercourse include infestation by the crab louse, and scabies.

Venereal diseases may be transmitted not only after their appearance but also in the incubation period (*i.e.* the time following exposure but before the development of lesions). They may lead to serious congenital defects in offspring. Though in theory these diseases are preventable, in practice prophylactic measures have shown disappointing results. Treatment with the sulphur drugs is usually effective, though cases occur in apparently increasing numbers in which it fails for unknown reasons.

The ministry of Health requires medical officers of health to have special qualifications for treating venereal diseases. It is an offence for a person to advertise that he will treat any person for venereal disease or prescribe any remedy or give any advice or, except with the sanction of the ministry of

Health, recommend to the public in writing or print any medicine for its prevention, cure, or relief. It is also an offence for any unqualified person for reward to treat or give advice on the disease.

Defence regulation 33B, announced on Nov. 11, 1942, empowered medical officers of health in the U.K. to require the attendance for treatment by specialists of all persons believed to be the source of infection with venereal disease of at least two separate patients.

Venerie OR VENERY (Lat. *venari*, to hunt). Obsolete term for hunting, the chase, game; also for a kennel for hunting dogs. It is used in connexion with hunting by Chaucer, Gower, Spenser, and Malory. Browning, in his *Flight of the Duchess*, uses the word *venerers* for hunters. Venerie, a term derived from Venus, was applied to promiscuous sexual intercourse.

Venetia. Name under Roman rule of an area approx. that of the later republic of Venice. It covered the modern "three Venices" (*le tre Venezie*): Trentino-Alto Adige (Venezia Tridentina), Veneto (Venezia Euganea), and Venezia Giulia (*g.g.v.*), and was called after the Veneti, the tribe inhabiting the area. After the city of Venice became a state in the 9th cent. she gradually absorbed the whole of Venetia. In 1797 Venetia was given to Austria, and confirmed to her by the treaty of Vienna, 1815. After the defeat of Austria by Prussia in 1866, part of Venetia was given to Prussia's ally Italy, who received nearly all the rest of it in 1919.

Venetian Alps. Section of the Eastern Alps. They lie between the Adige and the Tagliamento S. of the Dolomites and culminate in Monte Pramaggiore, 8,133 ft.

Venetian Glass. Fine variety of glassware produced in Venice, and first made c. 1100. The craftsmen by their skill turned out articles of great beauty, and Venetian glass took on its characteristic elegance and lightness. The island of Murano became the headquarters of the industry, and there it still flourishes, having been revived in the 19th century. *See* Glass.

Venetian Red. Pigment obtained by calcining green vitriol. It is ferric oxide, and is a permanent colour.

Veneto OR VENEZIA EUGANEA. Region of Italy. It comprises the provs. of Belluno, Padua, Rovigo, Treviso, Venice, Verona, and Vicenza, and lies between the Adriatic sea and the eastern Alps, the southern slopes of which are



Duc de Vendôme,
French soldier

and Italy. In 1695 he commanded the army in Catalonia, and crowned a brilliant campaign with the capture of Barcelona in 1697. During the War of the Spanish Succession he first fought in Italy, and

included in it. Most of it is an almost level plain across which the rivers Piave and Brenta meander to the sea. It includes Venice, Verona, and Vicenza, as well as many smaller towns. Area, 7,098 sq. miles. Pop. 3,600,000.

Venezia Giulia. Name of a former region of Italy, sometimes called in English the Julian Marches. Italy acquired the area, 3,457 sq. m., from Austria after the First Great War, losing all but 183 sq. m. of it after the Second to Yugoslavia and the free state of Trieste. Venezia Giulia lay along the E. of the Gulf of Venice, and included Istria, Trieste, and Fiume. The small part remaining to Italy after 1947 was reconstituted as the prov. of Gorizia, and included in the new region of Friuli-Venezia Giulia.

Venezia Tridentina. Former name of a region of Italy, since 1947 called Trentino-Alto Adige (q.v.).

Venezuela (Estados Unidos de Venezuela, United States of Venezuela). Republic of S. America. It borders the Caribbean Sea, with Colombia on the W. and S.W., Brazil on the S.E., British Guiana on the E., the Atlantic on the N.E. The area, 352,143 sq. m., embraces a variety of natural features and products. The dominant features are first the chain of the Andes and its E. extension in mountainous and hilly country along the Caribbean Sea, and secondly the river Orinoco, with its 436 tributaries.

The Cordillera de Mérida, the highest part of the Venezuelan Andes, with snowy peaks exceeding 16,000 ft., trends N.E. from the

Colombian frontier towards the Caribbean Sea; two parallel lower ranges enclose in their valleys and uplands the richest and most populous parts of the country.

South of the mts. to the Orinoco, and also over the whole S.W. of the republic, stretch the llanos, the vast grassy plains, about 100,000 sq. m. in extent, which in their general formation resemble the Argentine pampa. S. of the Orinoco to the borders of Brazil and British Guiana, and into the Amazon river system, stretches the vast region of tropical forest which covers more than half the territory of the republic, but contains only a small fraction of its pop. Four-fifths of the territory is drained by the Orinoco.

Though Venezuela lies wholly within the tropics, its climate is as varied as its alt. and configuration, from the torrid heat of the lowlands to the temperate airs of the hills, the icy blasts of the Andine páramos or high passes, and the snowy cold of the great heights. The trade winds

from the Atlantic cool and refresh the Caribbean coastal strip, but hardly affect the torrid shores of L. Maracaibo.

The llanos in their E. part are cooled by the N.E. trade wind. Caracas, the capital, situated near the coast at over 3,000 ft., has a tropical climate, mean monthly temp. varying between 64° F. in Jan. and 70° F. in May; two-thirds of the yearly rainfall of 32 ins. occurs during June-Oct.

CONSTITUTION. Venezuela's first constitution was signed in 1811. Later constitutions were introduced in 1908, 1936, and 1947. That of 1947 gave the state an important rôle in developing the national economy, while recognizing the right to private property; guaranteed individual right to education, work, and health services; gave to labour the right to organize and to strike, pensions, paid holidays, and some profit sharing, and to employers the right to form associations and to a fair return on capital; empowered the president to arrest, with congress's approval, suspected plotters against the regime, and, subject to revision by a plebiscite in 1949, to appoint governors of the states. Congress consists of a senate of 40 and a chamber of 160 deputies elected for four years. The president is elected by direct universal suffrage; in 1945 he was granted the power of veto on legislation, to be overcome only by a two-thirds vote of both houses of congress. He is assisted by a cabinet of ministers. Men and women vote from the age of 18; illiterates vote by means of coloured ballots. The 20 states of Venezuela are autonomous, each with a legislative assembly and a governor.



Venezuela arms



Venetian Glass. Specimens of white glass, made in the 16th century. Enclosed in the stem of the wineglass, right, are orange flowers in coloured glass

By courtesy of the Trustees, British Museum



Venezuela. Map of the South American republic

The R.C. religion prevails, but all religions are tolerated. Elementary education is free and in theory compulsory, but many of the people are illiterate. The pop., 3,850,771 in 1941, is of mixed



Venezuela. Carácas, the capital. 1. The Pantheon, housing the tomb of Simón Bolívar. 2. The Capitol. 3. General view of the city

European, indigenous Indian, and negro origin. Indian tribes inhabit the Guayana forests, and the territory of the independent Goajiro Indians extends from Colombia into N.W. Venezuela. The language is Spanish. The chief towns are Carácas, Valencia, and Maracaibo. The chief ports on the open sea are La Guaira, the port for Carácas, and Puerto Cabello, connected by rail with Valencia. The La Guaira and Carácas rly. (23 m.), connecting La Guaira with the capital is used only for freight; passengers travel by bus. The cities, 8 m. apart, have between them a mountain of 9,000 ft.

COMMUNICATIONS. Rlys., of a total length of 634 m., include a line connecting Puerto Cabello-Valencia-Carácas; Carácas-Ocumare; Barquisimeto-Tucacas; and lines carrying coffee and ores from the mountainous regions of Tachira, Mérida, and Trujillo. There are three main trunk roads from Carácas to Ciudad Bolívar (600 m.); from La Guaira to the Colombian frontier and on to Bogotá (736 m.); and from Coro

in the N., southwards through Trujillo and Mérida to San Cristóbal. This third highway connects with La Ceiba, whence there are lake boats to Maracaibo. The part of the Pan-American highway (*q.v.*) running through Venezuela was opened in 1943. There are in all 3,829 m. of roads passable in all weathers.

Most of the rivers running into L. Maracaibo are navigable by small craft, and the Orinoco and its tribes, in spite of obstructions, shallows, rapids, and changes of water-level, provide great stretches of navigation, estimated at 12,000 m. In the wet season ocean steamers can reach Ciudad Bolívar, 200 m. from the sea; smaller craft can ascend the river and its W. affluent, the Apure.

Venezuela is the second largest producer and the largest exporter of petroleum in the world, the basin of Lake Maracaibo being the most prolific known source of oil in S. America; there are other oilfields in E. Venezuela. The oils vary in grade from light to heavy and are exported mostly

in the crude state in tank steamers, though Venezuela is setting up its own refineries; 397,213,000 barrels of crude oil were exported in 1947, more than half to the Netherlands W. Indies for refining.

Gold is mined near Ciudad Bolívar; a little copper is produced; pearls, off the island of Margarita, asbestos, mica, tin, and salt are other products. Large iron deposits were found 50 m. S. of Ciudad Bolívar in 1949. Coal of poor quality is produced at Coro and elsewhere.

One-fifth of the pop. is occupied in agriculture, the principal products being coffee, sugar, cotton, cocoa, tobacco, and tonka beans. Coffee and cacao constitute about three-fourths of the agricultural exports of the country. Lack of transport has checked development in that part of the country suited to stock raising. Total head of cattle is some 4,000,000. The forests have been little worked; 600 species of woods have been identified. There are textile mills, glass, and cement factories, and a considerable industry in woodworking. Most of the large towns have electricity.

HISTORY. The European history of Venezuela begins with Columbus and his immediate successors. Spanish settlement on the coast dates from the early 16th century. A curious and unique episode in S. American history was the concession granted by Charles V to the Augsburg banking house of the Welsers to conquer and settle the W. region to which alone the name Venezuela was then applied. But Spanish authority soon replaced that of the Germans, and Venezuela proper, the W. part of the present republic, was attached to the government of Santa Fé de Bogotá. The E. part formed a separate government connected with the Spanish Antilles. It was not till 1776 that the captaincy-general of Carácas was constituted, comprising substantially the present limits of the republic.

Upon the fall of the Spanish monarchy in 1808, a junta was



Venezuela flag. Yellow, blue, and red

formed in Carácas "to preserve the rights of Ferdinand VII." But events moved towards separation, and in 1811 a Venezuelan

congress issued the first Latin-American proclamation of complete independence. There followed 11 years of destructive war between

royalists and republicans, with many sensational vicissitudes before Bolivar finally achieved Venezuelan independence.

Under Bolivar, Venezuela was united with New Granada and Quito to form one vast republic under the title of Colombia. But separatist and local influences detached Venezuela from this union in 1829 under the leadership of Paez. Paez remained the most powerful person in independent Venezuela, and maintained comparative tranquillity for about 17 years. The succeeding period of disorder, strife, and revolution was closed by the 20 years' dictatorship of Guzman Blanco (1870-89). A period of disturbance followed, which was, however, marked by the settlement of the boundary dispute with British Guiana through the intervention of the U.S.A. From 1901-08 Castro was dictator, and was succeeded by General Gomez, 1908-15. Venezuela remained neutral in the First Great War. She joined the League of Nations in March, 1920. Gomez returned to the presidency 1922-29 and 1931 until his death Dec. 17, 1935. Under President Angaritsa, Venezuela was neutral in the Second Great War until Feb. 16, 1945, when she declared war on Germany and Japan. She was a founder member of the United Nations, being represented at the San Francisco conference,

1945. President Gallegos, who took office Feb. 15, 1948, was deposed by a military revolt on Nov. 23, a fate not uncommon among Venezuelan presidents. *Consult* Venezuela's Place in the Sun, N. Roosevelt, 1940; Archaeological Survey of Venezuela, C. Osagoon and F. D. Howard, 1944.

Vengurla. Harbour of India, in Ratnagiri dist., Bombay state. It is situated on the shore of the Arabian Sea, 33 m. N.N.W. of Goa. Formerly a favourite haunt of pirates, it was the site of a Dutch factory (1638) and a British factory (1772). In 1812 it was ceded to the British by the rani of Sawantwari, the adjoining state. Pop. 24,000.

Venial Sins. In R.C. doctrine, term applied to sins which do not imperil the salvation of the soul. Such are either objectively or subjectively venial. In the first category are sins which in themselves are light, such as pilfering, impatience, or the telling of "white lies"; subjectively venial sins result when the evil-doer commits what may be a serious fault but is excused by imperfect knowledge or by thoughtless consent.

Venice. English form of the Latin Venetia and the Italian Venezia. It has been used for the area formerly comprising the republic of Venice, and for the modern Italian region Venezia Euganea, as well as for the city of Venice (v.i.).

motor boats, which created a wash that endangered the old buildings lining the canals. Steamboats ply through the Grand Canal to the Lido, the popular bathing station, and to the neighbouring islands, Murano, Burano, Chioggia, Torcello, etc. The Merceria, connecting the Piazza with the Rialto, is the principal street.

The heart of Venice is the Piazza of S. Mark. Approached from the narrow, irregular network of bridged canals behind it, this marble-paved square opens out into a blaze of light and life and colour. The approach from the water is through the Piazzetta, on which stand two granite columns brought from the East in 1125, one crowned with the winged lion of S. Mark, the other with a statue of S. Theodore, the first patron saint of Venice. The Piazzetta is flanked W. by the royal palace, begun 1582, and the old library, a beautiful building by Sansovino, 1536, and E. by the doge's palace. At the entrance to the Piazza rises the Campanile, reconstructed after the original watch-tower of the republic collapsed in 1902, destroying in its fall the exquisite Loggetta by Sansovino at its base. The ordered arches of the 15th and 16th century Procuratie, or government offices, line the N. and S. sides of the great square. At the E. end is grouped the most wonderful mingling of Byzantine and Gothic architecture in Europe, the blue-dialled clock tower, built 1499, the cathedral of S. Mark, and the doge's palace.

The Bridge of Sighs (c. 1600) connects the judgement halls of the palace with the prisons for ordinary criminals. The façade of the doge's palace is composed of three storeys, of which the upper, faced with rose-coloured lozenge-shaped slabs of marble, is equal in height to the two lower. This was the hall of the great council.

Sansovino built the mint (*zecca*) which now houses the immense treasures of the library of S. Mark, founded by Cardinal Bessarion, 1468. The academy, the civic museum, and many of the churches contain priceless examples of the Venetian school of painting.

The city's treasures escaped uninjured in the Second Great War except for the campanile of S. Niccolò dei Mendicoli, struck by a German shell during the German evacuation of the city; some window glass and Tripolo's fresco Antony and Cleopatra were damaged by the explosion of a German ammunition ship. British troops

VENICE: QUEEN OF THE ADRIATIC

Cecil Headlam, M.A., Author of *Venetia and Northern Italy*

For allied information see the article Italy and the biographies of the great Venetian painters, e.g. Canaletto; Guardi; Tiepolo; Tintoretto; Titian; and statesmen, e.g. Dandolo; Manin. See the entries Bucentaur; Doge; Gondola; and others associated with the Republic. See also S. Mark's

Venice (Ital. Venezia), a city and seaport of Italy, and the capital of the prov. of Venice, is situated at the head of the Adriatic. It is built mainly on piles in the Venetian Lagoon. The city, a naval station, is connected with the mainland by a rly. viaduct across the lagoon, 2½ m. long. Its pop. is 303,262.

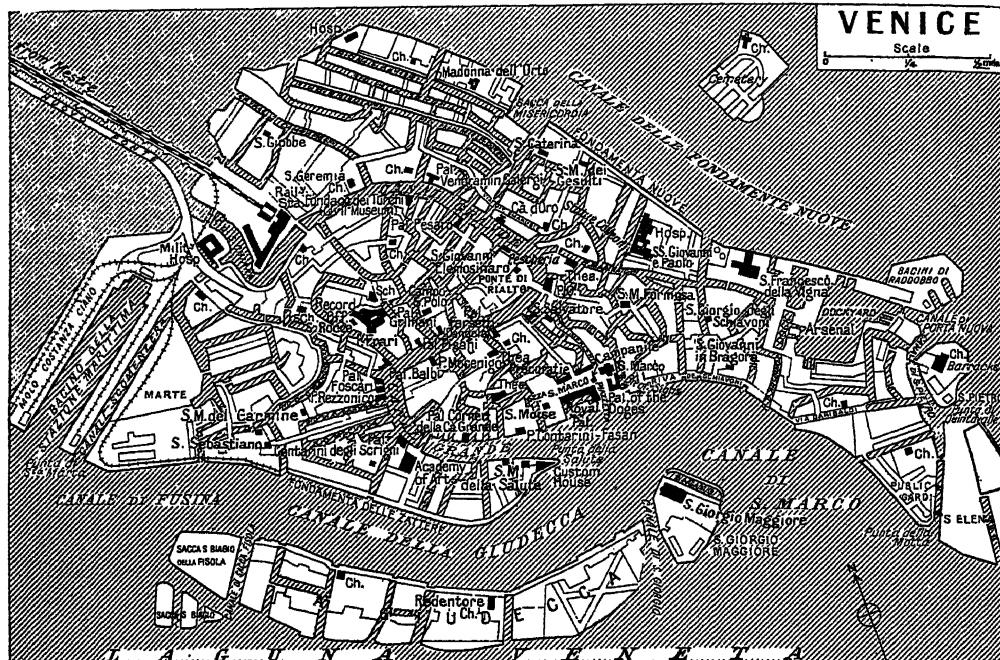


Venice arms

The three chief thoroughfares are waterways: (1) the Canale della Giudecca, separating the principal part of the town from the island of Giudecca, with the church of the Redentore by Palladio, 1580; (2) the open stretch of the Canale di San Marco, dividing the island of S. Giorgio Maggiore, with a church by Palladio, 1665, from the public gardens, the arsenal,

founded 1104, the Riva degli Schiavoni, the Doge's palace, the Piazzetta, and the royal palace; (3) the Canalazzo, or Grand Canal, issuing from the junction of these two at the point occupied by the 17th century custom house and the impressive pile of S. Maria della Salute, by Longhena, 1631. Winding in the shape of an S, the Grand Canal divides the city into two almost equal parts.

The Grand Canal, lined with the noble palaces of old patricians, is crossed by the famous bridge called the Rialto, by Boldù, 1588. This was the old business quarter of the merchants of Venice. More than 150 smaller canals (*rii*), with narrow paved passages along their banks, intersect the city. The canals, formerly navigated only by gondolas propelled by an oarsman on the raised stern, became under Mussolini highways for



Venice. Plan of the city at the head of the Adriatic, built on small islands intersected by canals, which form the streets

entered Venice, already in the hands of Italian patriots, April 29, 1945.

HISTORY. Venice was one of a dozen settlements upon the marshy islands which stretch along the N.W. shores of the Adriatic from the Piave to the Adige. These the inhabitants of the old Roman cities of Venetia used as temporary refuges from the Huns, 452. Under pressure from the Lombard invasion, they adopted them as their permanent homes. Heraclaea and Malamocco, on the Lido facing the Adriatic, at first disputed pre-eminence; but when Pepin's fleet threatened to enforce their allegiance to the Western empire, the confederate islanders decided to concentrate at Rivo Alto, a cluster of islands in the very heart of the lagoons, 811. Protected by tortuous channels, they defeated the Franks.

The state which thus arose became the great mart for exchange of goods between the East and N.W. Europe, a republic whose maritime supremacy endured for centuries, and one of the chief factors in European history. It was a community of merchant adventurers who, turning their backs upon the mainland, looked eastward and seaward for development. Under Doge Pietro Orseolo II (991) the Slav and Saracen pirates were suppressed and the essential water-

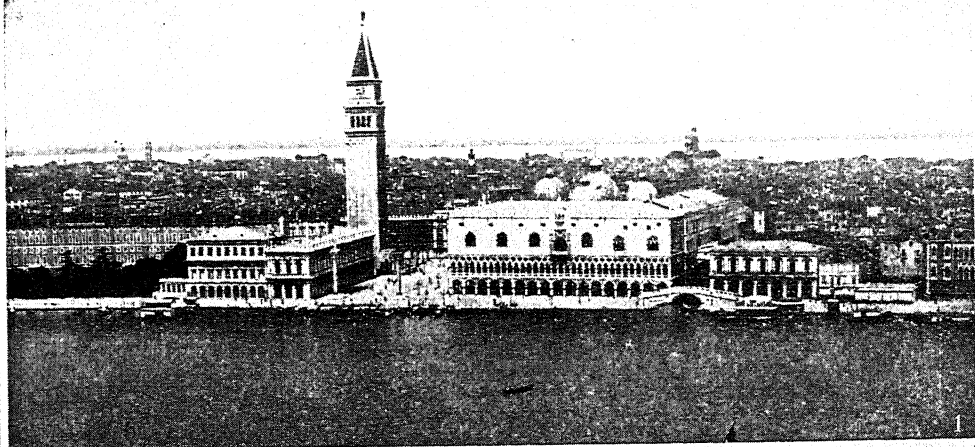
way of the Adriatic secured. The doge was recognized as duke of Dalmatia, whence timber for the fleet and food for the people were obtained. A ceremony called *la senza* was instituted, which later became the famous wedding of the sea (1177-1797), when the doge, from his gilded barge Bucentaur, cast a ring into the Adriatic, as a symbol of maritime dominion.

Medieval Enterprise

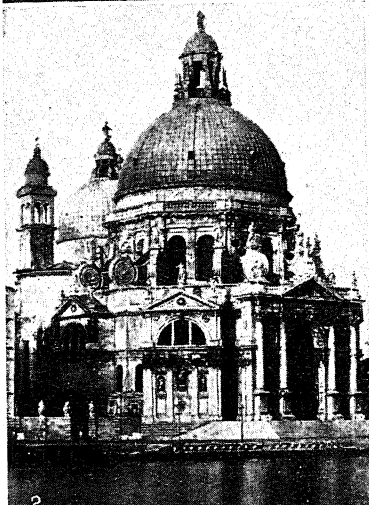
Profiting by the Norman conquest of the maritime cities, Venice shared the carrying trade of the Mediterranean with Pisa and Genoa. Owing allegiance to the Eastern empire, she obtained commercial concessions there. A Venetian quarter was founded in Constantinople (Istanbul), c. 1100, and factories were erected in the Syrian coast towns. Venice supplied goods and transport to the Crusaders and pilgrims; and the shrewd doge, Enrico Dandolo, diverted the fourth Crusade to the conquest of Constantinople, 1204. Out of her share of the spoil Venice obtained the Morea, many islands of the Aegean, and much of the mainland. She purchased Crete and Salonica, and held fast to Zara (Biograd) and other Dalmatian towns. Communications with Constantinople and the Syrian coast were thus rendered secure. The republic had become mistress of the Levant.

Her success involved an exhausting war with Genoa for the monopoly of the Levantine trade, 1294-1381. After many vicissitudes, Vettor Pisani crushed the Genoese fleet which endeavoured to blockade Venice from Chioggia, 1380. Venice emerged the supreme naval power in the Mediterranean. She subdued the whole coast from the estuary of the Po to Corfu, 1421, and acquired Cyprus, 1489. During the 14th century, in order to secure her food supplies and the free passage of her goods, she extended her empire to the mainland of Italy.

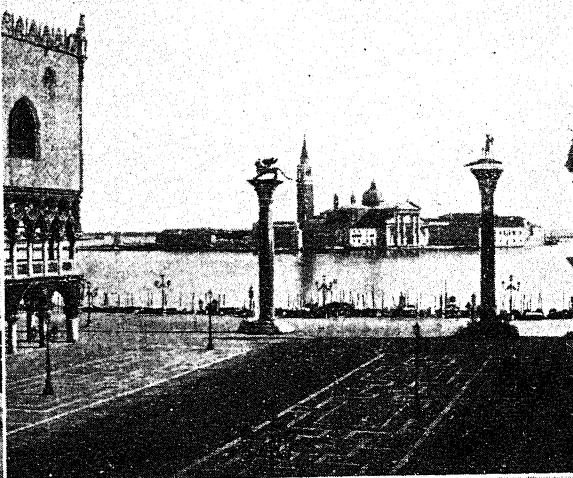
Under Foscari (1423-57) and such famous condottieri as Gattamelata and Bartolommeo Colleoni she advanced her territory to the Alps, the Adda, and the Po. A magnificent equestrian statue of Colleoni by Verrocchio and Leopardi stands outside SS. Giovanni e Paolo. Now one of the five leading Italian states, Venice aimed at supremacy. To check her aggression, the European powers combined in the league of Cambrai, 1508; yet at the treaty of Noyon, 1516, Venice emerged with little loss of territory. Her subjected towns maintained their allegiance, for the rule of the republic was lenient and just. Her colonial policy was to develop trade and leave local institutions free under a civil and a military governor. Venice had now reached the zenith



1



2



3



4



5

1. The city from S. Giorgio Maggiore, showing the Piazzetta with the campanile and library on one side and the Doge's palace and adjacent prison on the other.
2. Church of S. Maria della Salute, on the Grand Canal.

3. The Piazzetta, looking towards S. Giorgio Maggiore.
4. Rialto Bridge across the Grand Canal. 5. Bridge of Sighs, across which condemned prisoners passed from the Doge's palace, left, to the dungeons of the Piombi prison.

VENICE: FAMOUS BUILDINGS IN THE HISTORIC CITY OF THE ADRIATIC

of her power. Her citizens numbered nearly 200,000; her revenue amounted to 1,250,000 golden ducats. But the wars with Genoa and the European powers had sapped her vigour. She was paralysed by the discovery of the Cape route to the Indies, which diverted the eastern trade to Lisbon.

Rivals on the sea arose in England, Spain, Portugal, and the Netherlands. The capture of Constantinople by the Ottoman Turks, 1453, struck her another deadly blow. Venice was cut off from her trade with the Levant and through Egypt. Friuli was devastated. Yet the decline of Venice was very gradual and very brilliant. During the 16th and 17th centuries Venetian art reached its greatest, and the republic was almost the sole bulwark of Europe against the aggressive Turks.

But in spite of such brilliant episodes as Lepanto, 1571, she was gradually stripped by Turkey of all her possessions in the archipelago and the Morea, of Cyprus, 1571; Crete, 1669; and Negroponte (Euboea). Dalmatia she still retained by the treaty of Passarowitz, 1718. Yet splendour and pagantry reigned in the republic until it fell before Napoleon, 1797. He assigned it first to Austria and then to his kingdom of Italy, 1805. Austrian rule was restored by the congress of Vienna, 1815. The hated oppressor was expelled in 1848, when the republic of S. Mark was proclaimed with Daniele Manin for president. Radetzky reduced it after a siege lasting more than a year, July, 1848–Aug., 1849, and Austria ruled it until compelled to cede Venetia to Italy in 1866.

Constitution of the Republic

The constitution of the Venetian republic was originally democratic. At first twelve tribunes from the loosely confederated townships conducted the business of the lagoon commonwealth. A chief tribune or doge (*dux*) was elected as an executive head by assembly of the whole Venetian people, 697. But experience proved that the assembly was liable to adopt rash decisions, and that doges were tempted to make themselves hereditary tyrants.

The doge was reduced to a mere figurehead by the appointment first of two and then of six councillors who elected and advised him. On important questions he was also compelled to invite the advice of leading citizens. These advisers developed into a senate. The assembly was reduced to a deliberative council, which appointed the

officers of state, its legislative and judicial functions passing presently to the senate. This great council of 480 representatives, elected originally by the people, was in 1297 restricted to those whose paternal ancestors had sat in it since 1172. The names of this Venetian aristocracy of merchant princes were inscribed in the famous Golden Book.

The closing of the great council marks the final establishment of an oligarchy which proved one of the most stable and successful govts. known to history. To deal with a revolt against it in 1310 a council of ten was elected by the great council. Empowered to act swiftly and secretly in defence of the state, and aided by the doge and the ducal councillors, it soon absorbed the judicial and executive powers of the senate, leaving to that body the direction of finance and foreign affairs. In 1355 it decreed the execution of Marino Faliero for conspiring to make himself despot.

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Venice, GULF OF. Northern portion of the Adriatic Sea between Istria and the Venetian lagoons; its north-eastern corner forms the Gulf of Trieste.

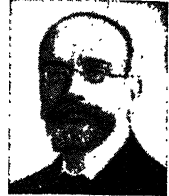
Veni, Creator Spiritus (Lat., Come, creator spirit). Pentecostal hymn in the Roman breviary. Though commonly attributed to Charlemagne, it is found in manuscripts written before his time, and was probably composed by S. Gregory the Great. It was translated into English (Come, Holy Ghost, our souls inspire) by Bishop J. Cosin (1594–1672).

Venison (old Fr. *veneison*, from Lat. *venari*, to hunt). Flesh of the deer. The buck is regarded as providing better meat than the doe. It should be hung as long as possible to make it tender.

Venite. First word (come, plur.) in the Latin version of the 95th Psalm (94th in the Vulgate). This psalm figured from very early times in the breviary as an introduction to the first service of the day which was sung in the monasteries after midnight. It may have been introduced into the West by S. Benedict and so entered the Roman breviary, being used daily save on the last three days of Holy Week. Taken into

the Anglican Prayer Book of 1549 as part of the introduction to morning prayer, the Venite has remained there ever since. The 1928 Prayer Book permitted omission of the last four verses.

Venizelos, ELEUTHERIOS (1864–1936). Greek statesman. He was born Aug. 23, 1864, in comparatively humble circumstances at Canea, Crete, and was educated at the university of Athens, becoming a barrister in 1886. Elected a member of the



Eleutherios Venizelos, Greek statesman

Cretan assembly next year, he soon was leader of the Liberals, and in 1896 headed the Cretan revolution. In 1905 he led a further revolt, resulting in the withdrawal of Prince George of Greece, the high commissioner.

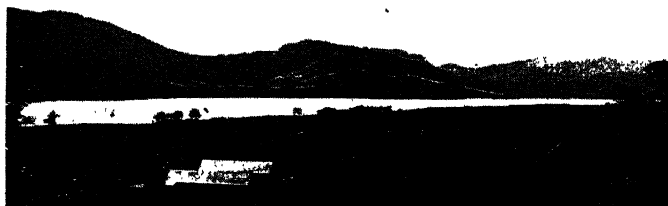
Venizelos went in 1909 to Athens, where he was chosen as head of a revolutionary military league which sought to purify political life. From that time he was the real leader of Greece, and its prime minister 1910–15. He attached his country to the Balkan League, fought through the Balkan Wars, and secured large additions of territory, including Crete.

On the outbreak of the First Great War he desired that Greece should support the Allies. Thwarted by King Constantine, he left Athens in 1916 and placed himself at the head of the Salonica revolution, establishing a government there. On the dethronement of Constantine in 1917, he went back to Athens as prime minister, joined the Allies against Germany, organized an army, and sent it into the field. An outstanding figure at the congress of Versailles, he secured great advantages for his country. But in the election following the death of King Alexander, he was defeated, Constantine returning to Athens.

He was premier in 1924 for a month; then left shortly before the proclamation of the republic. In 1928 he was again prime minister, but Royalist opposition led to his resignation in May, 1932, though he formed a brief ministry in June. Apparent sympathy with the attempted *coup d'état* of Gen. Plastiras (*q.v.*) next year led to Venizelos's eclipse as a popular figure. He died in Paris, March 18, 1936. Lives in English were written by S. B. Chester, 1921; H. A. Gibbons, 1921.

Venlo OR VENLOO. Town of the Netherlands, in the prov. of Limburg. It lies on the right bank of the Maas, 15 m. by rly. N.E. of Roermond, connected by bridge with its suburb Blerik on the opposite bank, and is a rly. junction. There are miscellaneous industries concerned with tobacco, electric lamps, paper, and engineering works. Venlo became a fortified place in 1343, was captured by Charles V in 1543, and was in French possession during 1801-14. Very badly damaged in the Second Great War, when Blerik was captured from the Germans by the British 2nd army Dec. 4, 1944, Venlo itself remained in German hands until cleared by the U.S. 9th army about March 1, 1945. Part of the "temporary" Waterloo bridge was later used in the construction of a temporary bridge at Venlo. Venlo had a noteworthy town hall, 1595, and a 15th cent. church of S. Martin. Pop. 41,000.

Vennachar. Loch of Perthshire, Scotland. About 4 m. in length and up to $1\frac{1}{2}$ m. across, it is



Vennachar. The loch, described in *The Lady of the Lake*, from the N. shore formed by the river Teith, and lies 2 m. W. of Callander, surrounded by beautiful scenery. Ben Ledi overlooks it. It figures in Scott's poem, *The Lady of the Lake*.

Venosa. City of Italy, in the prov. of Potenza. It is 52 m. by rly. S.S.E. of Foggia. The 15th century castle, the abbey church of the Santa Trinità (1059), which contains the tomb of its founder, Robert Guiscard, and the remains of an amphitheatre are the chief buildings. The Roman Venusia, it was the birthplace of Horace.

Venti. In classical mythology, the personifications of the winds. Their ruler was Aeolus (q.v.), who

kept them in a cavern in Aetolia. Some of the winds, such as Zephyrus, the W., were regarded as beneficent, while others, such as Aquilo, the N.E., were maleficent. The latter class were supposed to be the progeny of the monstrous giant Typhon (q.v.).

Ventilation (Lat. *ventilare*, to blow). Maintenance of an adequate circulation of fresh air of reasonable cleanliness and temp., allied with the continuous withdrawal of vitiated air. Air in occupied rooms becomes vitiated by exhalation, body heat, odours arising from the evaporation of perspiration, etc., and may be further impaired by products of combustion, as from the fuelless burning of gas and oil. Ventilation, as distinct from air conditioning, is confined to the filtration, temp. adjustment, and distribution of air. In houses and small buildings a

sufficient circulation of fresh air is normally obtained by natural exhaustion and infiltration; large buildings almost invariably require mechanical ventilation.

The relative purity of air is defined by volumetric standards expressed either as a number of complete air changes per hour, having regard to the degree of occupancy, or as a tabulated volume of fresh air to be provided every hour for each occupant.

Standard ventilation of public buildings is usually laid down by the local authority. Such regulations vary slightly from one district to another, but broadly con-

form to the standards shown in Table 1.

The Factory Act does not advance numerical standards of the volume of air to be circulated to maintain the "adequate" ventilation required in factories. It does, however, direct that not less than 400 cu. ft. of space, within a height of 14 ft., shall be provided for each occupant of a workshop; and recommends, in general terms, that the air be changed at least 6 times per hr. This is equivalent to 2,400 cu. ft. ($400 \times 6 = 2,400$) of air per person per hr. In special cases of low occupancy of large rooms a lesser air change, e.g. 4 per hr., would normally be sufficient. In contrast, processes productive of dusts or noxious fumes would entail more than 6 changes per hr. Rooms in which cellulose paints are sprayed are subject to 30 changes per hr.; up to 40 changes are not uncommon in kitchens and grills in large hotels.

In buildings subject only to natural ventilation by air infiltration and exhaustion aided by flues and chimneys, the hourly air change is dependent on a natural air flow, without draughts, and is of the order indicated in Table 2.

TABLE 2: Assumed Minimum Natural Air Change

Room	Hourly Air Change
Living room ..	1.0
Bed-sitting room ..	1.5
Bedroom ..	1.5
Nursery ..	1.5
Kitchen ..	2.0
Entrance hall ..	2.0
Bathroom ..	1.5
Water closet ..	2.0

Additions up to 50 p.c. are made for rooms having more than one external wall with door or windows.

Except where there is overcrowding, the figures in Table 2 compare well with the governmental recommendations quoted in Table 3, based on an allowance of 600 cu. ft. per person per hour.

TABLE 3: Recommended Minimum Standard of Ventilation

Room	Air Supply per hr.
Living room (4 persons) ..	2,400 cu. ft.
Bedroom (2 persons) ..	1,200 " "
Bedroom (1 person) ..	600 " "
Kitchen (cooking for 6 persons) ..	1,000 " "
Halls and passages	1 air change
Bathrooms and w.c.s.	2 air changes (or more)

Natural ventilation, other than cross-ventilation between open windows due directly to wind, relies on the displacement of warmed air from within a building by a natural convective inflow of cooler and, therefore, denser air from outside. In houses, the outflow occurs chiefly through the chimneys of fireplaces and boilers, the inflow via ill-fitting doors and windows, and through high-level air-bricks connected to hopper-shaped deflectors inside rooms. Alternatively, a low-level grated inlet may be located behind an encased heating unit, e.g. a column radiator. This virtually solves the problem of cold draughts, and is probably the most satisfactory method of wintertime natural ventilation yet devised. Chimney draught normally induces one air change per hr. during summer, and 4 when a fire is alight; 10 changes may occur in an extreme case of a large fireplace and chimney, and a very low outside temp. The down-draughts felt near windows in heated rooms, and countered by heavy curtains, are due more to the sudden descent of previously warmed air, cooled by contact with cold glass, than to the ingress of cold fresh air. In buildings other than houses, the outflow may be arranged through louvered or cowed roof ventilators, connected to extract ductwork when the building is partitioned into rooms.

The principal disadvantages of natural ventilation are that little control can be exercised over the quality, quantity, and temp. of the incoming air, and that a completely reversed circulation may be set up by an adverse wind.

Mechanical ventilation implies the mechanical propulsion of air by means of a fan. The three systems, in order of simplicity, are (a) extract, (b) intake or plenum, (c) combined intake and extract.

(a) The requisite quantities of air are exhausted from the building by one or more fans, normally of the propeller pattern. Inflow occurs as in natural ventilation, but without risk of reversed circulation. In the domestic application, an electrically driven fan, 6 ins. in diam., is fitted into a kitchen window or wall, and is used only during periods of cooking and washing. This provides the kitchen with 6 to 10 or more air changes per hr. The continuous flow of air towards the kitchen prevents steam and cooking smells from reaching other rooms, and materially improves the ventilation of the whole house. The kitchen window



Ventimiglia, Italy. The frontier town, from the sea; in the centre stands the former citadel, to the right of which is the Gothic cathedral

and outside door should be closed to prevent short-circuiting of air.

(b) In plenum ventilation (Lat. *plenus*, full) a centrifugal fan draws air into a building, thus creating an internal air pressure slightly in excess of that of the atmosphere outside the building. This prevents the haphazard ingress of air as in natural and extract systems. The sole air inlet is the fan intake. This is usually arranged to draw air through a filter, and then over a heating or cooling battery before propelling it through the distribution trunking and grilles. Outflow occurs through grated openings in external walls during cold weather: these would be closed by shutters during summer when windows would usually be open.

(c) The combination of mechanical extraction with plenum ventilation admits of a considerable measure of heat conservation by the recirculation of some 75 p.c. of the total hourly requirements of the rooms, and further allows the withdrawal of smoke-laden air just above head level. This is the system used in air conditioning.

Circulating ceiling and desk fans are in no way connected with ventilation. The localised air movement set up by them serves only to give a feeling of comfort in still, humid air by increasing the convective cooling of the skin. See Air Conditioning; Fan; Humidity.

J. W. Cowan

Ventimiglia. Seaport with fortified harbour, and health resort, of Italy, in the prov. of Porto Maurizio (Imperia), and in the Riviera di Ponente. On the shores of the Ligurian Sea, travellers from France to Italy here pass through the customs and change trains. The town is 95 m. by rly. S.W. of Genoa

and has direct rly. connexion via Cuneo with Turin. The Gothic cathedral occupies the position of a former Lombard church which was built on the site of a temple to Juno. An old castle crowns the hill. About 3 m. E. are remains of the ancient city, Album Intimilium, including parts of the walls, a theatre, and tombs. Roman antiquities form a collection in the modern town hall. The Balzi Rossi caves are of archaeological interest. Olive oil, wines, and flowers are the principal products. Bombed by Allied aircraft in the weeks preceding the Allied landing in S. France, Aug. 15, 1944, Ventimiglia was captured by the French, April 27, 1945. Pop. 16,000.

Ventnor. Watering-place and urban dist. of the Isle of Wight, England. Situated 12 m. S. of Ryde, on the rly., the town is built in the sides of a cliff, its buildings rising in terraces one above the other. Its mild climate attracts many invalids, and here is the Royal National hospital for consumptives. In the locality are St.



Ventnor, Isle of Wight. Bathing beach and part of the town built on the steep cliff-face

Boniface Down and Bonchurch. The latter has a Norman church, S. Boniface, of great age; in the churchyard of its new church Swinburne is buried. Steephill Castle is also adjacent to Ventnor, as is the Undercliff. Pop. 6,943.

Ventôse (Fr., month of wind). Sixth month in the year as rearranged during the French Revolution. It began on Feb. 19 or 20. See Calendar.

Ventriculites. Genus of fossil sponges, found in the Upper Chalk beds. They may be either simple or compound. They possess cups, either funnel-shaped or cylindrical, attached to the rock by root-like appendages of siliceous fibres. They often occur enclosed in flints, and are common in Thanet and the Isle of Wight. *See* Sponge.

Ventriloquism (Lat. *venter*, stomach; *loqui*, to speak). Art of making the human voice appear to proceed from a distance, or from some person or object other than the actual speaker. Ventriloquism has often been described as speaking in the stomach. This is not the fact, but some contraction of the stomach muscles does take place in speaking with immobile lips. Making a voice appear to proceed from a distance or from images was a trick practised at ancient oracles, especially in Egypt. While much skill and practice are required in the control of the voice by a clever ventriloquist, a great portion of the illusion is brought about by suggestion, the performer subtly indicating to his audience the direction or position whence the voice is supposed to come. The effect of distance or direction is produced by accurate mimicry of the sound as it would appear if actually emanating from the supposed source. *See* Acoustics; Sound; Voice.

Ventspils (Ger. Windau; Russ. Vindava; Lith. Ventpilis). Seaport of Latvia S.S.R. It lies in the Courland pen. where the river Venta enters the Baltic. Trade through its safe harbour consists of imports of salt herring, machinery, coal, exports of timber, alcohol, wheat, linseed. Here are distilleries, breweries, saw-mills, and a school of navigation. Fishing is an occupation. The castle was built in 1244 for Dietrich, then head of the Teutonic order. The town dates from 1314: it was annexed to Russia in 1795 on the abdication of Peter, duke of Courland. During the Second Great War, the Germans captured Ventspils, July 1, 1941, and held it until after the general surrender in May, 1945.

Venturimeter. Instrument for measuring the rate of flow of a liquid in pipes; sometimes called a venturi tube. There is a tube, with a constriction in its centre, and other small tubes at the entrance to and narrowest part of the constriction. The free ends of the tubes are led to the two sides of a U-tube containing mercury. When the venturimeter is placed in the line of the pipe whose rate

of flow is to be measured, the difference in level of the mercury in the two legs of the tube measures the difference in pressure in the two small tubes. The flow of liquid in the pipe can be calculated by the formula:

$$Q=ab\sqrt{(2gH)/((a^2-b^2))},$$

where Q is the flow in cu. ft. per sec.; g , the acceleration due to gravity (32.2 ft. per sec. per sec.); H , the difference of heights of mercury in tube in ft.; a , the cross-sectional area of pipe at widest portion in sq. ft.; and b , the cross-sectional area of pipe at narrowest portion in sq. ft.

Venue. English legal term signifying the county or place whence the jury who are to try a case must come. At common law certain actions could be tried only in and by a jury of the county where the subject-matter of the action was situate. The Judicature Act, 1873, abolished all local venues in civil actions. In criminal cases, as a rule, a prisoner is tried in the county where the crime was committed.

Venus. In Roman mythology, originally the goddess of gardens, and subsequently identified by the

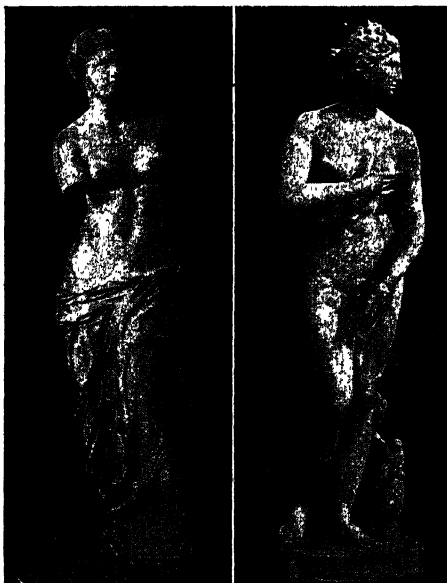
mother of Aeneas, the legendary founder of the race, Venus became one of the major deities of the Romans, though before the 4th century there is little evidence of her worship. *See* Adonis; Aphrodite; Astarte; Cupid; Paris.

Venus. One of the inner planets. Known to the ancients as Phosphorus and Hesperus, the morning and evening star, it is the second known planet from the sun, revolving in an orbit between the earth and Mercury. Its mean distance from the sun is 67,270,000 m., diameter 7,700 m., and period of revolution round the sun 224.7 days. Venus presents to the earth phases like those of the moon, and is the brightest planet at all times, ranging between three and 12 times as bright as Sirius. It is faintest when at the far side of its orbit, where, though its phase is full, the illuminated disk is small; and also when closest to the earth, where, though it appears large, only a thin crescent is illuminated. It is brightest when its phase is like that of the five-days-old moon. The planet has no satellite; its mass can be estimated approxi-

mately from the perturbations it produces in the motion of the earth and of Mars: it appears to be about eight-tenths that of the earth. Its density is 90 p.c. that of the earth.

The surface of Venus is white and highly reflecting, and shows little trace of detail in the telescope. Its period of axial rotation is a matter of dispute. Early observations suggesting a period of about 23 hours were discredited in 1890 by Schiaparelli, who decided that the planet always presented the same face to the sun and must therefore rotate in 225 days. Pickering in 1920 deduced a period of 68 hours and stated that the axis of rotation is inclined at only 4°-5° to its orbital plane.

Ultra-violet photographs by Ross in 1927 showing variable markings are inconsistent with a short period; while spectroscopic observations showing that the velocity of rotation is too small to



Venus. Famous statues of the ancient goddess. Left, the Venus of Milo, in the Louvre, Paris, dating from the 2nd century and discovered at Melos in 1820. During 1940-45 it was hidden in a castle on the Loire. Right, the Medici Venus, in the Uffizi Gallery, Florence

Romans with the Greek Aphrodite, goddess of love. All the myths relating to Aphrodite were attributed also to Venus. As the wife of Mars, a deity widely worshipped among the Romans, and as the

measure suggest a period of at least 25 days. The temp. of the dark side is, however, too high for Venus to be always turned away from the sun, so a period of rotation of 1-6 months is likely.

The atmosphere of Venus can be seen telescopically in the crescent phase, when the "twilight arc" sometimes extends right round the dark disk. Spectroscopic study is confined to that portion of the atmosphere which extends above the visible surface; this almost certainly consists of clouds. Adams and Dunham showed in 1932 that absorption bands in the infra-red spectrum were due to carbon dioxide, but could detect neither oxygen nor water vapour. The nature of the clouds is unknown.

Transits of Venus across the surface of the sun have been watched with great interest as offering a means of calculating the distance of the earth from the sun. The transits take place in June and Dec. The June ones run in pairs separated by eight-year intervals, as do the Dec. ones; the period from one pair of transits to the next is over 100 years. The next transits are June 8, 2004, and June 6, 2012. The first to be recorded was in 1639, by Horrocks.

Venus and Adonis. Poem by Shakespeare, first published in 1593, and the earliest work bearing his name. Based on one of the stories in Ovid's *Metamorphoses*, it tells how Adonis, having scorned the proffered love of Venus, went boar-hunting and was killed, and how, where he fell, there sprang up a flower said to be either the anemone or the adonis. The sensuous, beautiful poem is written in six-line stanzas, closing with a couplet, like the sestet of the Shakespearean sonnet.

Venusberg (Ger., mountain of Venus). In German legend, the name of several hills, especially the Hørselberg, near Eisenach, in Thuringia, where Venus was said to hold her court in a cave. Towards the close of the Middle Ages the name of Venus was substituted for those of the native divinities Hørsel and Holda, both, perhaps, names of the Teutonic goddess of love, Frigg. Tannhäuser (*q.v.*), like others, was beguiled by Venus. A section of Wagner's opera Tannhäuser is known as the Venusberg music.

Venus's Fly-trap (*Dionaea muscipula*). Perennial insectivorous herb of the family Droseraceae. A native of N. Carolina and Florida, it has a somewhat bulbous root-

stock from which all the leaves proceed direct. Each leaf has a long stalk which is winged on each side, the blade of the leaf forming two nearly half-circular lobes whose outer margins are fringed with sharp rigid spikes. These lobes close together, under certain conditions, when the fringe of spikes interlocks like the teeth of a rat-gin. In the centre of each lobe stand three sensitive filaments, and when either of these is touched by any insect, the lobes immediately shut together, entrapping the insect. See Bog Plants; Insectivorous Plants.

Venus Shells. Genus of marine bivalve molluscs of the order Eulamellibranchiata. Of almost world-

leaves, and tubular flowers, blue inside and lilac outside.

Vera Cruz (Span., true cross). Maritime state of Mexico, on the Gulf of Mexico. The interior is mainly mountainous, Orizaba, on the Puebla boundary, exceeding 18,000 ft. Agriculture is the staple industry, the chief products being coffee, tobacco, fibre, cacao, cotton, and sugar. Petroleum is extracted; cattle are reared; and textiles are manufactured. The capital is Jalapa. There is a state university. Area, 27,736 sq. m. Pop. 1,619,338.

Vera Cruz. One of the leading seaports of Mexico. In the state of Vera Cruz, it stands on the Bay of Campeche, 265 m. E. by S. of



Vera Cruz, Mexico. The Custom House, Post Office, and, in the centre distance, the railway station

wide distribution, six species are found native on British coasts, whilst a seventh, the Clam (*Venus mercenaria*), whose wave-worn valves the N. American Indians used to make "legal tender" under the name of wampum, has become naturalised in the Humber. The Smooth Venus (*V. chione*) has a triangular-oval shell nearly 4 ins. long. See Bivalve; Mollusca; Shell.

Venus's Looking Glass (*Specularia perfoliata*). Annual herb of the family Campanulaceae, a native of Europe and N. Africa. It has small, oval or spoon-shaped

Mexico City. It has a spacious and secure harbour, but is an unhealthy city, with few architectural features. Coffee, ores, tobacco, sugar, and rubber are the leading exports, and machinery, textiles, and iron and steel ware the principal imports. Fishing is engaged in, and cigars and furniture manufactured. Pop. 75,756.

In 1599 the town of Villa Nueva de la Vera Cruz, founded by Cortés in 1519, was transferred to the present site. The castle of San Juan de Ulúa was begun in 1582. Besieged by the French in 1838 and 1862, and by the Americans in 1847, the city was held for a few months in 1914 by U.S. troops.

Veraval. Harbour of India, in the union of Saurashtra. It is situated 40 m. N.W. of Diu, on the S.W. coast of the Kathiawar peninsula, and has a coasting trade and rly. service. Once the chief port of embarkation for pilgrims to Mecca, it has interesting temples. The port of Somnath lies 3 m. S.E. Pop. 24,000.

Verb (Lat. *verbum*, a word). Part of speech which asserts something about something else in reference to an action or state. In some languages there is no verb, its place being supplied by



Venus's Looking Glass. Spray of leaves and flowers. Inset, left, root; right, tubular flower

nouns and adjectives, or indicated by the position of words in the sentence, as in Chinese. Other languages, notably Turkish, exhibit an extraordinarily large number of verbal forms. Verbs may be transitive, the action of which passes on to an object (he sees me); intransitive, requiring no object (he stands); or impersonal, which cannot be used with a personal subject (it rains).

Grammarians distinguish also other classes of verbs: causative, desiderative, frequentative, inchoative. Verbs have (or had) three voices, active, middle, and passive, the last being the latest development; four moods, imperative, indicative, optative, subjunctive; tenses varying in number in different languages, referring to present, past, and future time; three numbers, singular, plural, dual; three persons, first, second, and third, referring to the speaker, the person spoken to, the person or thing spoken of. The infinitive mood so called is not really a mood, but the case of a noun. See Noun.

Verbena. Genus of herbs and sub-shrubs of the family Verbenaceae (*v.i.*), mostly natives of



Verbena. Leaves and flower spikes of vervain. Inset, single flower

America, with opposite or alternate leaves, and small tubular flowers in terminal clusters or spikes. Many are in cultivation for greenhouse decoration or summer bedding outdoors. The vervain or holy herb (*V. officinalis*) is a native of Europe, N. Africa, and W. Asia, growing in dry, waste ground. It is a downy perennial, with dense spikes of tiny lilac flowers.

Verbenaceae. A family of herbs, shrubs, and trees. They are natives mainly of tropical and temperate regions. Leaves are opposite or whorled, mostly undivided. Flowers are tubular with the mouth cleft into four or five spreading lobes, usually forming two lips. The family includes

the genera *Tectona* (teak), *Lippia*, *Clerodendron*, *Lantana*, *Vitex*, and *Verbena*.

Vercelli. City of Italy, in the prov. of Vercelli, Piedmont. It stands on the Sesia, in a low fertile



Vercelli, Italy. The Romanesque church of Sant' Andrea, built by canons from Paris in the early 13th century

plain, and is a rly. junction 44 m. W.S.W. of Milan and 49 m. N.E. of Turin. The 17th century cathedral library contains many rare MSS., including the Vercelli Book (*v.i.*). The Romanesque Gothic church of Sant' Andrea dates from 1219. A centre for trade in rice and wheat, the town also has large flour and rice mills. Silks, machinery, matches, silver ware, and surgical instruments are other products. Here Marius defeated the Cimbri in 101 B.C. The city passed from the rule of the Visconti of Milan to that of Savoy in 1429. Pop. est. 39,000. *Pron.* Vair-chellee.

Vercelli Book. Anglo-Saxon MS. of the early 11th century, containing unique copies of Cynewulf's poems, Andreas, and the Fates of the Apostles, as well as the beautiful Dream of the Rood, probably of earlier date, three other poems, a prose Life of S. Guthlac, and some homilies. The MS. was discovered in 1822 in the cathedral library of Vercelli, Piedmont, by a German scholar.

Vercingetorix (d. 46 B.C.). Chieftain of the Arverni. In 52 B.C. he was the leader of Central and Southern Gaul in their last struggle for independence against Rome. A leader of unusual ability and the most formidable foe encountered by Caesar in his Gallic campaigns, he was finally compelled to take refuge in the strong fortress of Alesia, on the fall of which he was taken prisoner to Rome, where he was put to death.

Verden. Town of Germany, in Lower Saxony. On the Aller, 23 m. S.E. of Bremen, it is a rly. junction and river port. Its

industry includes the making of furniture, bricks, tobacco, and soap. Its main claim to fame is that Charlemagne here, after defeating the Saxons in 782, was alleged to have beheaded 4,500

hostages. The town was the seat of a bishopric from 785 to 1648. For 150 years a free city, Verden was under Swedish rule during 1648-1712, then belonged to Denmark, coming to Hanover in 1719. Among its finest buildings are the churches of S. John and S. Andrew, both 12th century, and the 13th century cathedral.

After the Second Great War, in which it escaped serious damage, Verden came within the British zone of occupation. Pop. 18,200.

Verderer (Late Lat. *viridarius*, from *viridis*, green). Forest official. He was chosen in the county court by the freeholders. His duty was to inquire into complaints brought by the foresters with regard to injuries done to the vert (forest covers) or venison (beasts of the chase). See Dean, Forest of; New Forest; Speech House.

Verdi, GIUSEPPE (1813-1901). Italian composer. Born at Roncole, Parma, Oct. 9, 1813, he received his earliest lessons in music from the parish organist, whose place he took at the age of 10. Verdi then attended a school at Busseto, and studied at the Milan conservatory. In 1839 his first opera, *Oberto*, was produced, and was followed three years later by *Nebucco*. With the production of *I Lombardi*, 1843, Verdi's reputation as the leading Italian composer was established, and his fame became world-wide with the appearance of *Rigoletto*, 1851, and *Il Trovatore* and *La Traviata*, both in 1852. Their melodious arias have never lost their popularity. The *Sicilian Vespers*, 1855; *Un Ballo in Maschera*, 1859; and *La Forza del Destino*, 1862, enhanced the composer's fame. In *Aida*, 1871, written for the khedive



Giuseppe Verdi

Ismail Pasha, he produced both musically and dramatically a masterpiece which some consider the best of his compositions.

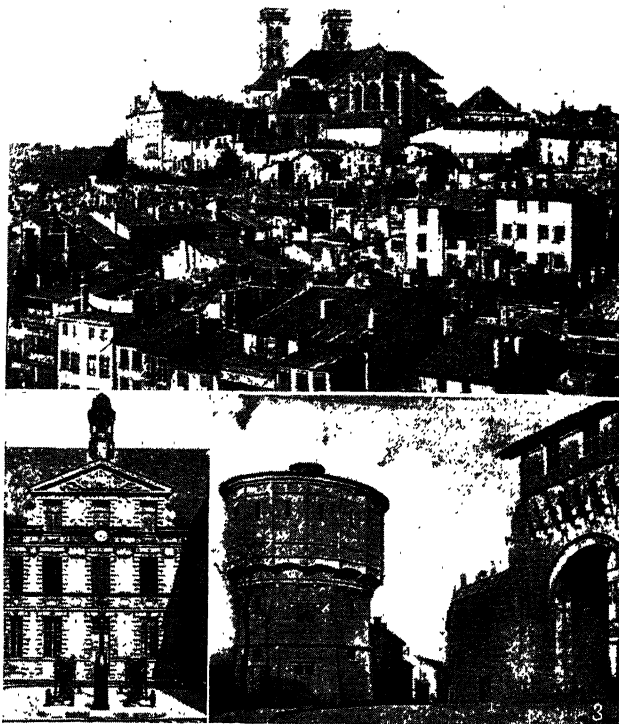
In 1887 *Otello*, technically one of his best works, was performed, and with *Falstaff*, 1893, his sole effort in comedy. Verdi closed his active career as the most popular Italian operatic composer of the century. He had been made a senator in 1874, and during his life occupied a unique place in Italy. In 1898 he endowed at Milan a home for old and invalid musicians, devoting £40,000 to that purpose. He died at Milan, Jan. 27, 1901. In addition to operas Verdi wrote the *Manzoni Requiem*, 1874; *Hymn of the Nations*, 1862; and some romances and quartets, all of which showed considerable merit. In 1898 he composed four pieces of sacred music. *Consult* Lives, F. Toye, 1931; F. Werfel, 1944; F. Bonavia, 1948.

Verdict (Lat. *vere*, truly; *dictum*, spoken). In law, the finding of a jury as declared to a judge. A verdict is either general or special. A general verdict is where the jury determines the case in favour of one party or the other. If there be more than one issue to be tried, the jury may find some of them in favour of one, and some of the other party. A general verdict is delivered orally in court.

A special verdict is one in which the jury finds certain facts, generally in answer to written questions put by the judge. These questions and answers constitute a special verdict, and on them the judge must apply the law, and give judgement for plaintiff or defendant accordingly. Special verdicts are of the rarest possible occurrence in criminal cases.

In Scotland a verdict goes by the majority, but in England it must be unanimous. In Scotland, also, in a criminal case, a jury may find not proven, meaning thereby that they are not satisfied of the innocence of the prisoner, but neither are they convinced of his guilt. *See* Trial.

Verdigris. Mixture of the three basic acetates of copper used as a pigment, and in dyeing and calico printing. Verdigris is prepared at Grenoble and Montpellier in France, by acting on sheets of copper with the residues from the wine factories. In ten to twenty days the copper plates become covered with green crystals of verdigris, the variety prepared in this way being known



Verdun, France. 1. The town and cathedral viewed from the Meuse. 2. The town hall. 3. The Chatel gate, showing on the left, the water-tower which was a gift to their adopted town from the citizens of London

as blue verdigris. Green verdigris is made in England by placing cloths moistened with acetic acid on copper plates, so arranged as to allow of free access of air. The process takes five to six weeks.

The name is also applied to the bluish-green skin formed on metallic copper when exposed to air containing carbon dioxide. The green basic carbonate of copper, $\text{CuCO}_3 \cdot \text{Cu}(\text{OH})_2$, is most probably formed. While this is not desirable for the industrial uses of copper, verdigris is thought to improve the appearance of copper or bronze used for decorative purposes, such as for statuary. *Pron.* ver-dig-ree-se.

Verditer. Basic salt of copper. It is prepared by shaking chalk with a solution of copper nitrate, when a green precipitate is obtained. If the precipitate is mixed with freshly burnt lime a blue pigment, blue verditer, results.

Verdun. Town of France, in the dept. of Meuse. It lies on the hilly banks of the Meuse, 30 m. N.N.E. of Bar-le-Duc and 174 m. by rly. E. of Paris. Verdun is the seat of a bishop, and after 1870 became a first-class fortress, its ring of surrounding forts forming, with those of Toul, one of the main

defences of the French E. frontier. There is much river traffic on the Meuse, which here begins to be navigable. Pop. 14,609.

The cathedral of Notre Dame was consecrated in 1147, replacing the original 5th century church, rebuilding taking place after a fire in 1755. The roof was destroyed during a bombardment in 1917, but the wood carvings of the choir were removed for safety in 1916. The *Porte Chaussée*, a bridge-gate dating from the 15th century, was untouched. The damaged citadel occupies the site of the abbey of S. Vanne, and was first begun in 1552. Many old houses rising steeply from the river bank were demolished, 1916-17, and the town hall also suffered. The law courts were almost destroyed in the Second Great War.

Verdun is one of the most ancient historic towns of France. The Roman fortress of Verodunum replaced a Gallic stronghold. Owned by Clovis and by the rulers of Austrasia, it gave its name to the treaty signed here in 843. The county of Verdun passed into the hands of the bishops of Verdun in the 10th century, but a communal charter was secured by the

townspeople after a revolt in 1247. Henry II of France gained the town in 1552, his acquisition being confirmed by the treaty of Cateau-Cambrésis, 1559. It resisted a Huguenot attack, 1589, and was captured by the Prussians, 1792. In the Franco-Prussian War, Verdun, poorly protected, surrendered on Nov. 8, 1870. Its part in the First Great War is described below. In 1916 the town received the cross of the Legion of Honour and other Allied war decorations. Near Fort Douaumont is a memorial marking the place where 57 French soldiers died in defence of Verdun, buried alive when their trench gave way.

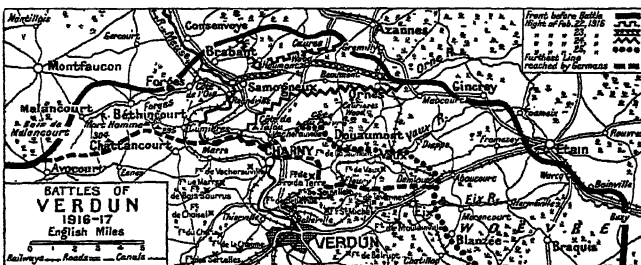
In the Second Great War, following the break-through in Champagne, German armoured and infantry formations developed a fanwise advance, the most spectacular achievement of which was the capture of Verdun after a brief resistance on June 15, 1940. After the Franco-German armistice it lay in the occupied zone. Verdun was liberated on Sept. 1, 1944, by Gen. Patton's U.S. 3rd army after a 60-m. advance from Reims.

Verdun, BATTLE OF. Major engagement of the First Great War, fought between German and French forces and occupying the greater part of 1916. The first phase, from Feb. to June, consisted of a series of increasing German attacks with the object of capturing the Verdun garrison. Though they met with some success, their prime object was not achieved. The second phase, June to Dec., saw the success of great French counter-strokes which drove the Germans from ground they had won at high cost.

The German offensive, under the command of the crown prince, opened Feb. 21. In the initial stage five picked German divs., with overwhelming artillery, overran French defences to the N. and N.W. of Verdun held by only two French divs. Reinforcement of the French by two further divs. was not sufficient to stem the advance, and defending forces to the E. and S.E. were drawn in closer to the town. Gen. Pétain was placed in command of the defence on Feb. 25, on the same day that Fort Douaumont and the Harcourt strong-work to the N.E. fell to the Germans. But the first crisis was now over, as further French reserves were arriving rapidly and the defenders were superior in everything but artillery. After desperate fighting the

front N. of Verdun was temporarily secured by the end of Feb., with the Germans still about 3½ m. from the garrison.

The second German attack opened March 4 to the N.W. On March 9 the attack was intensified on both sides of the Meuse by 10 German divs. For the most part this attack was broken, the attackers making only minor advances. The Germans therefore changed their tactics, limiting their offensive to attacks of great violence on smaller fronts. These continued throughout March and April, but in spite of small advances the opposition was most determined, and the attackers received at least as much as they gave. By the beginning of May the French had been able to recover some of the ground lost in these attacks.



Verdun. General map of the area included in the battles of 1916-17, where some of the most determined fighting of the First Great War took place

The third big German attack opened May 3 in the hope of securing the commanding heights of the Mort Homme region to the N.W. of Verdun. Terrible fighting ensued for the various hills, with fierce attacks and counter-attacks. Then early in June the German artillery concentrated on the reduction of Fort Vaux to the N.E. It fell on June 8. This success led the Germans to attempt yet another attack on June 23, in the hope of seizing Fort Souville, only one m. N. of Verdun, and possibly of breaking into Verdun itself. Advancing with 50 battalions, they captured Fleury and penetrated into Fort Froide Terre, but failed in the main objective. By the following day the guns on the Somme had opened in preparation for the British attack of July 1, and from that moment the pressure on Verdun was eased. However, the loss of Fort Vaux had compelled the opening of the Somme battle at an earlier date than had been intended.

Under Nivelle, now in command at Verdun, and determined to hold the Germans as tightly as possible to assist the Somme offensive,

the French began to gain ground. The Germans were obliged to remove most of their heavy batteries to the Somme, and had no fresh troops available. On Oct. 24 Mangin struck a tremendous blow in the Douaumont region, and made a rapid advance. Fort Douaumont was stormed by Moroccan troops and held against four German counter-attacks. Over 6,000 German prisoners were taken. Mangin next prepared to recapture Fort Vaux, but on Nov. 2, just as he was about to deliver a final assault, it was evacuated by the Germans as untenable. By Nov. 5 the French had recovered most of the vital points to the N.E. of Verdun.

To continue the offensive Mangin had to wait to accumulate shells and construct roads, but on Dec. 15 he renewed the attack,

and within three days had ended the battle with the re-establishment of the French front to the N.E. almost as it had stood in Feb. Moreover, he had captured 11,387 prisoners and 115 guns.

German losses from Feb. 23 to Nov. 5 were 328,500. French losses to the end of the year were 348,300.

The positions the Germans had secured on the Mort Homme and elsewhere to the N.W. were retaken by the French in Aug., 1917.

Verdun. Residential suburb of the city of Montreal, Canada. It stands on the island of Montreal. Pop. 67,349.

Vere. Name of a famous English family. They came from Ver, in Normandy, and in the 12th century in England Aubrey de Vere secured the hereditary office of lord great chamberlain and his son the earldom of Oxford. With occasional intervals, due to political troubles, they held the office until the death of the 18th earl in 1625, and the title until the death of the last male of the line, Aubrey, 20th earl, in 1703. The barony of Vere then passed to his daughter, Diana, wife of the 1st

duke of St. Albans. Their chief seat was Castle Hedingham, Essex, and they had large estates in that county. *See* Oxford, Earl of; *consult* The Fighting Veres. Sir C. R. Markham, 1888.

Vere, SIR AUBREY DE (1788-1846). Irish poet. Born Aug. 28, 1788, eldest son of Sir Vere Hunt, of Curragh Chase, Limerick, a collateral descendant of the 15th earl of Oxford, he was educated at Harrow, succeeded to his father's baronetcy in 1818, and assumed the name of De Vere by letters patent in 1832. His first literary work was a dramatic poem on Julian the Apostate, 1822. It was followed by Irish and other poems, a volume of sonnets which received high praise from Wordsworth, and a drama with Mary Tudor as its central figure, published posthumously in 1847. De Vere died July 5, 1846.

Vere, AUBREY THOMAS HUNT DE (1814-1902). Irish poet and essayist. Born at Curragh Chase, Limerick, Jan. 10, 1814, third son of the above Sir Aubrey, he was educated at Trinity College, Dublin, and in 1857 became a Roman Catholic. Among his poems, much influenced by Wordsworth, are *The Search after Proserpine*, 1843; *The Sisters*, 1861; *St. Peter's Chains*, 1888; *Mediaeval Records and Sonnets*, 1893; and two poetical dramas, *Alexander the Great*, 1874, and *St. Thomas of Canterbury*, 1876. He also published volumes of critical essays, 1887 and 1889, and a book on Ireland, 1848.

Vere, SIR FRANCIS (1560-1609). English soldier. A grandson of the 15th earl of Oxford, in 1585 he joined Leicester's expedition to the Netherlands, and for his services at the defence of Sluys and of Bergen-op-Zoom was knighted in 1588. Next he was appointed commander of English troops in the Netherlands. In 1596 he served in the expedition against Cadiz, but was soon again in Holland, where he was made general of Elizabeth's forces. During

1599-1604 he added to his reputation by victories at Bommel and Nieuport, and by his defence of Ostend. He died in London, Aug. 28, 1609. Vere's leisure was occupied in writing his *Commentaries*, published in a popular edition in 1883.

Vere, SIR HORACE (1565-1635). English soldier. Younger brother of the above Sir Francis, he went to the Netherlands in 1590 and on the expedition to Cadiz in 1596, when he was knighted. He distinguished himself under his brother at the battle of Nieuport and



Sir Horace Vere,
English soldier

the defence of Ostend, and in 1604 succeeded Sir Francis in command of English forces there. In 1620 he was chosen to lead a body of English soldiers to the aid of Frederick, elector palatine; he landed in Holland, and was soon participating in the Thirty Years War, but after a fine and prolonged defence of Mannheim was forced to surrender to Tilly in 1622. He died suddenly at Whitehall, May 2, 1635.

Vereczke Pass OR VERECKY PASS. Way over the Carpathian Mts. In Ukraine S.S.R., it is on the old frontier between Poland and Slovakia, and carries the rly. between Lvov and Budapest. Its alt. is 2,750 ft.

Vereeniging (Afrikaans, union). Town of the Transvaal, S. Africa. At 4,750 ft. above sea level, it stands on the Vaal 49 m. by rly. S. of Johannesburg, and has a pop. of 11,500 Europeans and 29,000 others. This is the principal coal-producing centre in the Union, and has plentiful hydro-electric power, iron and steel works, saw-mills, and factories making drills, nuts and bolts, bricks and tiles, and farm implements. The govt. maintains a pasture research station, and there are up-to-date municipal buildings. Vereeniging was laid out in 1892, was the venue of a conference which led to the Anglo-Boer treaty (v.i.) ten years later, and received municipal status in 1905.

Vereeniging, TREATY OF. Peace signed between Great Britain and the representatives of the two Boer republics, Transvaal and Orange Free State, May 31, 1902. The terms included the annexation of the republics by Great Britain; all in arms were to sur-

render; and all who took an oath of allegiance to the king were to be returned to their homes. £3,000,000 was given to the Boers as compensation for the destruction of their farms, and the Dutch language was allowed in schools and law courts. Great Britain undertook to grant a civil administration to the two colonies at an early date, and to respect the liberty and property of the Dutch. As the treaty was actually signed at Pretoria, it is sometimes called the treaty of Pretoria. *See* South African War.

Vergennes, CHARLES GRAVIER, COMTE DE (1717-87). French diplomatist. Born at Dijon, Dec. 28, 1717, he was minister at Treves, 1750, and in 1755 ambassador at Constantinople, where he proved slow in following Choiseul's instructions to secure Turkish aid for Poland, and was recalled, 1768. He then held the embassy at Stockholm, 1771, but his real work for France was done as foreign minister from 1774. Vergennes concluded the treaty with America against England, 1778, and those of Teschen, 1779, and Versailles, 1783. As chief of the finance council, 1783, he concluded the Eden treaty (q.v.) with England, 1786; and having secured the appointment of Calonne (q.v.) died at Versailles, Feb. 13, 1787.



Comte de Vergennes,
French diplomatist
After A. Callet

Vergil. Publius Vergilius Maro, the great Roman poet, is entered in this work as Virgil.

Vergil, POLYDORÉ (c. 1470-c. 1555). Anglo-Italian historian. He was born at Urbino, to whose duke he became secretary. He wrote *Proverbiorum Libellus*, 1498, and *De Inventoribus Rerum*, 1499, translated into English by J. Langley, 1546, new ed. 1868. Sent to England as a collector of Peter's pence, he was appointed rector of Church Langton, Leics, 1503. Naturalised in 1510, he was imprisoned in 1515 for offending Wolsey. Vergil published the first edition of *Gildas*, 1525; next year came his treatise *De Prodigis*; and in 1534, in Latin, that History of England from the Earliest Times to the 16th Century which is his chief monument. A tr. of part of the History, ed. Sir H. Ellis, was published by the Camden Society, 1844-46. Vergil returned to Italy about 1550, and died at his native town.



Sir Francis Vere,
English soldier



Aubrey de Vere,
Irish poet
Fred Hollyer

Vergniaud, PIERRE VICTORNIEN (1753-93). French revolutionary. Born at Limoges, May 31, 1753, he was educated at the Collège du Plessis, Paris, and became



Pierre Vergniaud,
French revolutionary

a barrister at Bordeaux, 1781, entering the legislative assembly in 1791. He became its president in Oct., 1792, being also leader of the Girondin club. An orator of remarkable power and classical style, and an uncompromising enemy of the monarchy, he supported the declaration of war against Austria and Prussia, and stood against the September massacres. Vergniaud made his mistake in consenting to the death sentence on Louis XVI. He could thereafter do nothing to check the Terror, and opposition to Robespierre led to his arrest with the other leaders in June, 1793. Tried in Oct., he was guillotined on the 31st. *Pron.* Vairnyô.

Verhaeren, ÉMILE (1855-1916). Belgian poet. Born at St. Amand, near Antwerp, May 21, 1855, he was educated at Ghent, and studied law at Louvain university. There as founder of the review, *La Semaine*, he showed poetic gifts, and he was a leader of the literary revival in Belgium centering in *La Jeune Belgique*. He published his first book of verse, *Les Flamandes*, 1883. Other volumes include *Les Moines*, 1886; *Les Soirs*, 1888; *Les Campagnes Hallucinées*, 1893; *Les Villes Tentaculaires*, 1896; *Toute la Flandre*, 1904-11; *Les Rhythmes Souverains*, 1910; and largely inspired by the First Great War, *Les Ailes Rouges de la Guerre*, 1916. Verhaeren was accidentally killed in Rouen rly. station, Nov. 27, 1916. He was in many ways the most distinctive and powerful of modern Belgian writers.



Émile Verhaeren,
Belgian poet

Verity, HEDLEY (1905-43). English cricketer. Born at Rawdon, near Leeds, May 18, 1905, he first appeared for Yorkshire in 1930 and gradually succeeded W. Rhodes (*q.v.*), on whose style he had modelled his slow left-arm bowling. In 10 seasons of cricket he took 1,956 wickets at an average cost of

14.87 runs each, figures which created a record among bowlers of his type. He played in 40 test matches, first going to Australia in 1932. Among his world records were 17 wickets in a day, 1933; 14 in a day in a test against Australia, 1934; all 10 wickets for 10 runs, 1932. In his last first-class match, 1939, he sent seven batsmen back for 9 runs. Verity's best season, 1936, brought 216 wickets and 855 runs, and for some weeks he headed the batting averages. The perfect stylist, he finished top in the bowling averages in 1930 and 1939, and never lower than fifth. He died of wounds received in action in Italy, July 31, 1943.

Verkhoyansk. Capital of a province in Yakutsk A.S.S.R., Asiatic Russia. On the Yana, it is reached by air services from Yakutsk. Here the mean Jan. temperature is -61° F., and that of July is 60° F., which gives a mean range of 121°, the largest in the world.

Verlaine, PAUL (1844-96). French poet. He was born at Metz, March 30, 1844. After a short period as a clerk, he began publishing poems influenced by Baudelaire, which won him fame among those who came to be known as the Decadents. *Poèmes Saturniens*, 1865, were followed by *Fêtes Galantes*, 1869, and *La Bonne Chanson*, 1870. As a result of activities during the Paris Commune, 1871, he went into exile in England and elsewhere with Arthur Rimbaud (*q.v.*). In 1874 he published *Romances sans Paroles*. In Belgium Verlaine quarrelled with Rimbaud, fired a pistol at him, and in consequence spent two years in prison at Mons. The alcoholic Bohemian artist emerged



Hedley Verity,
English cricketer



Paul Verlaine,
French poet

a devout Catholic, and after another sojourn in England as a teacher of French, he settled in Paris, in broken health and poverty.

In 1881 Verlaine issued *La Sagesse*, tender religious poems reflecting his new spirit; this was followed in 1884 by a volume of prose criticism, *Les Poètes Maudits*, and a further book of poems, *Jadis et Naguère*, 1885. Later

works included *Amour*, 1888; *Parallèlement*, typifying the duality of the poet in strange alternations of verses on sin and repentance, 1889; *Bonheur*, 1891; *Dédicaces*, 1894; *Confessions*, 1895. Only just before he died Jan. 8, 1896, was Verlaine acclaimed one of the greatest French lyric writers. His *Oeuvres Complètes* were published in 1899-1900.

Bibliography. *Life and Work*, E. Lepelletier, Eng. trans. 1909; *Derniers Jours de Paul Verlaine*, F. A. Cazals and G. Le Rouge, 1923; *Poet under Saturn*, M. Coulon, Eng. trans. 1932; *Life*, H. Nicolson, new ed. 1934.

Vermeer, JAN (1632-75). Dutch painter. Johannes Van der Meer was born in Delft, christened Oct. 13, 1632, and at 15 apprenticed to the guild of S. Luke there. After his marriage to Catherine Bolenes in 1653 his name was entered on the guild's books as a master-painter. A pupil of Fabritius, he was probably employed at the Delft falence factory. As a painter he was appreciated during his lifetime, but far less for a century after his death, which occurred at Delft, Dec. 13, 1875.

Among the finest Dutch masters, he painted chiefly portraits and genre-like compositions of two or three figures, and an occasional landscape. He is unsurpassed in technique: bright red, blue, white, yellow, and black are miraculously combined to produce a luminous effect. He invented a technique of underpainting, probably a thin coat of tempera on water-colour covered by a layer of varnish, on top of which the oil colour was applied. His figures show little movement; their gestures appear to reflect their tranquil lives. Modern scholarship recognizes only 41 pictures as definitely by Vermeer. The most famous are *Head of a Girl*, and *View of Delft*, at The Hague; *Lady at the Virginals*, in the National Gallery; *The Music Lesson*, at Windsor Castle; *Girl with Pearl Necklace*, which was at Berlin, and *The Artist in his Studio*, at Vienna. The forgeries perpetrated by Van Meegeren in 1945 are mentioned under *False Antiquities*. A standard monograph on the artist is by C. Hofstede de Groot, 1909; and E. V. Lucas published a study, 1922.

Vermejo OR **BERMEJO** (Sp., *vermilion*). River of S. America. It rises near the border of Bolivia, and flows S.E. across the Chaco region of N. Argentina to reach the Paraguay after a course of 750 m. Its name arises from the colour of its flood waters.

Vermicelli (Ital., little worms). Italian food manufactured from a wheaten paste such as is used for macaroni, and pressed out into thin threads resembling worms. It is used chiefly in soups and puddings. See Macaroni.

Vermicide (Lat. *vermis*, worm; *caedere*, to kill). Substance made to kill worms, especially those in the intestines of men and animals.

Vermiculite. Name applied to biotite micas which have undergone alteration by hydrothermal solutions. Dark yellowish-brown in colour, the mineral expands more than ten times by exfoliation on heating. Vermiculite is mostly used for insulating interior walls of buildings against heat and sound, and for fireproofing; mixed with cement and gypsum, it makes partition walls, floors, and plasters. Finely ground, it may be used in oilless lubricants in place of graphite.

Vermilion. Variety of mercuric sulphide used as a pigment. It is prepared by subliming the black sulphide obtained by heating sulphur with mercury in an iron pan. The sublimation process is usually carried out in clay retorts, but an alternative wet process is more economical and is becoming more widely used. Vermilion is one of the permanent pigments, a brilliant scarlet in colour, and possessing great body and weight.

Vermin (Lat. *vermis*, worm). Name given to obnoxious insects and animals. It is usually regarded as including bugs, fleas, and lice; also rats and mice; while it is frequently extended to cover weasels, rabbits, and other animals destructive to game or crops.

Vermland or **VÄRMLAND**. Län or co. of Sweden. It extends N. of Lake Vänern along the boundary of Norway, and contains most of the valley of the Klar river. It forms the S. portion of the Swedish Highlands. Iron is mined in the S.E., and copper at Vittensten in the W. The wood-pulp industry is of importance. The three long Fryken lakes form a navigable waterway for shallow draught vessels. Area of dept., 7,427 sq. m. Pop. est. 273,166.

Vermont. State of the U.S.A. In New England, its area is 9,609 sq. m. It derives its name from the Green Mts. which extend throughout its length from N. to S., containing several peaks above 3,500 ft. The Connecticut, which forms the boundary with New Hampshire, is the only river of importance; part of the W. frontier is marked by Lake Champlain, in

which are several islands belonging to Vermont. More than a million acres are under cultivation for cereals, pasture land abounds, and dairy farming is valuable; butter, cheese, and maple sugar being among the chief commodities. The state produces about half the marble of the U.S.A., besides slate and granite. There are 34 state forests, continuously replanted since 1909. Vermont talc mines rank second in the country, while asbestos production exceeds that of all other states combined. When English imports of china clay were restricted in 1939, exploitation of Vermont deposits began.

As a result of heavy migration of Anglo-Saxon stock to the far W. and the Mississippi valley the pop. has been virtually stationary since 1830; it includes a marked French Canadian element. The Vermont frugality, taciturnity, and folk wisdom, exemplified in the poetry of Robert Frost (*q.v.*) or in the personality of the native Calvin Coolidge, are proverbial throughout the U.S.A. Vermont university and other institutions provide first-class education, and there are 87 public high schools. Two senators and two representatives are returned to congress; in politics this state, like Maine, is invariably Republican. Montpelier is the capital; other cities include Burlington and Rutland. There are c. 900 m. of rly. and 12 airports.

The first English settlements were made towards 1700, and possession of the district was disputed between New Hampshire and New York. Dissatisfied with their condition, the inhabitants declared themselves an independent state in 1777, and remained so until Vermont joined the 13 original states of the Union, 1791. Pop. 359,231. Consult V.: the Green Mountain State. W. H. Crockett, 4 vols., 1921.

Vermouth. Liqueur manufactured in or near Turin and in France. It is made from alcoholised white wine, aromatised with wormwood (Ger. *Wermuth*), gentian, oranges, angelica, etc., and sweetened. French vermouth, made by a complicated process of fortification from white Hérault wines, is "dry," and contains some 17 p.c. of alcohol. Italian vermouth ("It.") has slightly more alcohol, is "sweet," and in Italy is usually drunk with aerated water. Vermouth is one of the lighter liqueurs.

Vernal Grass (*Anthoxanthum odoratum*). Perennial pasture grass of the family Gramineae. A native of Europe, N. Asia, and N.

Africa, it has a creeping rootstock, and many erect stems. The leaves are flat and hairy. The flower cluster is oval and spike-like. There are only two stamens in each flower with large yellow or purple anthers. The plant gives off the characteristic odour of new-mown hay, such as is found also in woodruff, tonkabean, etc. Its name is due to early flowering, April to June. See Grass.

Verne, JULES (1828-1905). French author. Born at Nantes, Feb. 8, 1828, he early turned to



Jules Verne

writing, and soon found his special vein in the romance based on scientific discoveries, and invented extensions of them (which often anticipated later developments). Giving a sug-

gestion of verisimilitude to the wildest flights of his fancy, his stories depend for their interest entirely upon incident, and not at all upon characterisation. Nearly all have been translated into English, notably *Five Weeks in a Balloon*, 1870; *The English at the North Pole*, 1870; *Twenty Thousand Leagues Under the Sea*, which introduced Capt. Nemo and his submarine, 1870; *Around the World in Eighty Days*, 1873; *The Mysterious Island*, 1875; *From the Earth to the Moon*. Verne died March 24, 1905. His brilliance is shown by the fact that only H. G. Wells ever rivalled him as a narrator of scientific romance.

Verner's Law. Name given to a law regulating certain consonantal changes in the Teutonic languages, discovered by the Danish scholar Carl Verner. The original voiceless spirants k, t, p, in the middle of Germanic words, are represented by h, th, f, if the vowel next preceding carried the accent according to the Indo-European system of accentuation; if not, by the voiced g, d, b. Compare Skt. *satām* (hundred), Gr. *he-katon*, Lat. *centum*, Goth. *hundra*, Eng. *hundred*, where, according to Grimm's Law, th would have been expected for d. Brother (Skt. *bhrātor*) follows the rule, but father, mother (Skt. *pitrā*, *mātār*) should be fader, moder, and in fact are so written in Old English. Analogy is probably responsible for the irregularity. Verner's Law is complementary to, and corrects, Grimm's Law. See Grimm's Law; Teutonic.

Vernet, ANTOINE CHARLES HORACE (1758-1835). French painter, usually known as Carle



Carle Vernet, French painter

Born at Bordeaux, Aug. 14, 1758, son of C. J. Vernet (v.i.). he studied under his father and took the Prix de Rome, 1782. After a visit to Italy, he settled at Paris, and in 1788 was admitted to the Academy. He was an exceptional painter of horses, and rendered vast impressions of Napoleonic battles. He also did portraits, genre, and landscapes. He died Nov. 17, 1835.

Vernet, CLAUDE JOSEPH (1714-89). French painter. Born at Avignon, Aug. 14, 1714, he studied under his father and Adrien Manglard. He was in Italy almost continuously 1734-53, painting landscapes, and then returned to France to execute a series of French seaports, commissioned by the government. He died at the Louvre, Dec. 3, 1789.

Vernet, ÉMILE JEAN HORACE (1789-1863). A French painter. Born in Paris, June 30, 1789, he studied under his father, Carle Vernet, and F. Vincent. Having fought under Napoleon he found the most suitable subjects for his art in military portraits and panoramic battle pictures. The emotion is stereotyped, but the work was very popular. He died in Paris, Jan. 17, 1863. See Napoleon illus. p. 5965.

Verneuil, BATTLE OF. Fought Aug. 17, 1424, between the English and the French aided by a strong body of Scots. The English regent, John, duke of Bedford, was carrying on the war for his young nephew, Henry VI, while the French were striving to free their land from the invader. The rival armies met outside the little town of Verneuil. Whereas the French and Scots were 20,000 strong, the striking force being a body of 10,000 men-at-arms just landed from Scotland, the English were about 12,000. Attacking, the French and Scots were heavily defeated, and Verneuil was surrendered to the English.

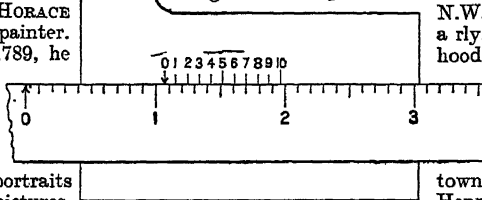
Verney, SIR EDMUND (1590-1642). English courtier. Member of an old Bucks family, he was educated at Oxford, served in the Low Countries, and after travelling in France and Italy, settled at

court, being knighted in 1611. Attached to the household of Prince Charles in 1613, although a Puritan in religion, he accompanied him to Madrid, and in 1626 was made knight marshal of the king's palace. He sat in the short and long parliaments. He bore the royal standard at the battle of Edgehill, where he was killed, Oct. 23, 1642. His son, Sir Ralph Verney, fought on the parliament side in the war. A baronetcy was conferred on the head of the family in 1818.



Sir Edmund Verney, English courtier After Van Dyck

Vernier. Device applied to a scale to give accurate readings in fractions of the smallest division of the scale. A sliding caliper vernier is shown in the accompanying illustration, as engraved on the sliding jaw. The scale on the shaft gives measurements in tenths of inches. The vernier scale has ten divisions, together equal to



Vernier. Diagram of portion of a scale, reduced, showing a measurement of 1.07 in. See text

nine divisions of the scale; each therefore representing $\frac{1}{10}$ of $\frac{1}{10}$ of an inch. In the illustration the zero mark of the vernier has passed the inch mark of the scale, but has not reached the next $\frac{1}{10}$ inch mark. To decide the value of the fraction the vernier is consulted, and its 7 line is found to correspond exactly with a scale mark. It is evident that the 6 line of the vernier is $\frac{1}{10}$ of $\frac{1}{10}$ inch to the right of the nearest scale mark on its left; the 5 line, $\frac{2}{10}$ of $\frac{1}{10}$ inch; and so on to the zero mark, which is $\frac{7}{10}$ of $\frac{1}{10}$ inch beyond one inch. The reading therefore is 1.07 inch. If the vernier scale had 20 divisions equal to 19 of the scale, the difference would then only be $\frac{1}{20}$ of $\frac{1}{10}$ inch. Circular scales may also have attached verniers, which will in form be a short length of the circumference of the circle. The device is named after Pierre Vernier (d. 1637) of Brussels.

Vernis Martin. French name for a type of lacquer. So called from the four brothers Martin, who in the reign of Louis XV became famous for their lacquer work, vernis Martin was an improvement on Oriental lacquers, and not an entirely new invention. Vernis Martin work reached its greatest popularity during the 18th century. See Fan.

Vernon, H.M.S. The principal torpedo school of the Royal Navy. Originally housed in hulks moored in Portsmouth harbour, the school was moved to its present shore establishment in 1910, but is still rated as a ship. Officers and ratings attend for instruction in all branches of torpedo work, and there is a research establishment for the development of new weapons. Attached to H.M.S. Vernon is the mines school, which instructs in the arming and disarming of sea mines and in mine-laying. A party from H.M.S. Vernondismantled the first German magnetic mine salvaged in the Second Great War.

Vernon. Town of France, in the dept. of Eure. It lies on the left bank of the Seine, 12 m. by rly. N.W. of Mantes-Gassicourt, and is a rly. junction. In the neighbourhood are mineral springs and quarries, and artillery engineering shops. To the N. stretches the Forest of Vernon, to the S. that of Bizy. Formerly a fortified town, the tower was built by Henry I of England, 1123. Here Aug. 26, 1944, the British made their first crossing of the Seine, during the liberation of France in the Second Great War. Pop. 11,242.

Vernon. Town of British Columbia, Canada. It is situated on the E. bank of Okanagan Lake, 50 m. S. of Sicamous, on the C.P.R. and C.N.R., and is the h.q. of the associated growers of British Columbia. It is the centre of a large irrigated fruit-farming district, and has a dehydrating plant and a number of fruit packing houses. Pop. 5,209.

Vernon, BARON. British title held by the family of Venables-Vernon. Its first holder was George Venables-Vernon, M.P., created a baron in 1762. From him the title passed to his son and other descendants. George, the 8th baron (1888-1915), died on active service during the First Great War, and his brother Francis William (b. Nov. 6, 1889), succeeded him as 9th baron. Lord Vernon's seat is Sudbury Hall, Derby.

Vernon, DOROTHY (d. 1584). Daughter and co-heir of Sir George Vernon, of Nether Haddon, Derbyshire, who from his wealth, lands, and generosity was called "king of the Peak." She married, after a legendary elopement, Sir John Manners (d. 1611), second son of the 1st earl of Rutland, and brought Haddon Hall to the Rutlands. She died June 24, 1584. Sullivan's opera, *Haddon Hall*, and several novels, were based on her romantic story. See *Haddon Hall* and *illus.*

Vernon, EDWARD (1684-1757). British sailor. Born at Westminster, Nov. 12, 1684, he joined the navy in 1701, served in the *W. Indies* and *Mediterranean*, and became rear-admiral at the age of 24. M.P. for Penryn, 1727-34, in 1739 he commanded a fleet to the *Antilles*, and captured *Porto Bello*. Unsuccessful operations against *Cartagena* and *Santiago de Cuba* followed, and he was again M.P. from 1741 until his death, Oct. 30, 1757. He introduced the issue of rum and water, called after his nick-name, *Grog* (q.v.).

Verona. Prov. of N. Italy, in *Venetia*. It is adjacent to *Tirol* and *Lake Garda*, and is drained by the

Adige. In the N. are the slopes of the *Venetian Alps*; the S. is a low level plain which yields rice, wine, and fruit. Its area is 1,185 sq. m. Pop. est. 500,000.

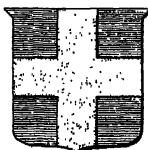
Verona. A city of N. Italy, capital of the prov. of *Verona*, in *Venetia*. It stands on a meander of the *Adige*, where the embanked river is crossed by 7 bridges, 72 m. by rly. W. of *Venice*. One of the fortresses of the quadrilateral, it is an important rly. junction.

In the large *Piazza Vittorio Emanuele* is the ruined amphitheatre, which dates from the time of *Diocletian*. On or near the *Piazza* are the municipal buildings, parts of the Roman walls, and the *Museo Lapidario*.

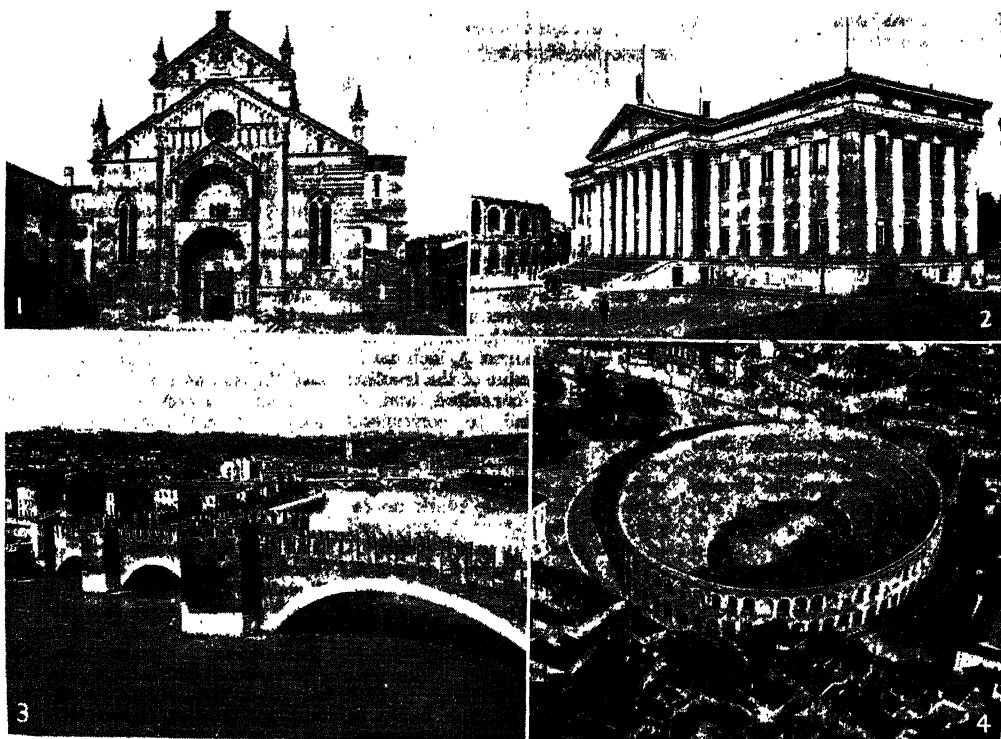
To the N. is the cathedral, which dates from 1187. The *Castel Vecchio* dates from 1355. Of the churches the most notable are the magnificent *Romanesque basilica, San Zeno Maggiore* (1139), *San Fermo Maggiore* with a fine façade, *Santo Stefano*, once restored by *Theodoric the Ostrogoth*, and the

Dominican church of Sant' Anastasia, a treasure house of pictures and sculptures. These were among 17 of the city's churches damaged in the *Second Great War*. The national museum and picture gallery are in the *Palazzo Pompei*. Cottons, flour, paper, nails, pianos, silks, soap, sugar, and candles have been manufactured. Wines, fruit, rice, and marble are the chief articles of trade. Pop. 153,708.

Verona became a Latin colony in 89 B.C., and was later a favourite residence of *Theodoric*, who enlarged and beautified the city. Taken by the *Lombards*, 568, it passed under the *Frankish king Pepin*. About 1250 it fell into the hands of the great *Ghibelline* family of *Scaliger* and passed to *Milan*, 1387, *Venice*, 1405, and *Austria*, 1797. The city became Italian in 1866. *Catullus* and *Paolo Veronese* were natives. During the *Second Great War* *Verona* was entered by the *Allied 5th army*, April 26, 1945, when the *Adige* was crossed near the city. About a third of *Verona* had been destroyed by *Allied bombing*, and much more was wrecked by the *Germans*, who blew up all seven bridges over the river.



Verona arms



Verona, Italy. 1. Facade of the 12th century cathedral. 2. The Municipio, showing the ancient amphitheatre on the left. 3. The 14th century Ponte Scaligero, destroyed by the Germans, 1945. 4. Air view of the amphitheatre in the Piazza Vittorio Emanuele. It was erected by Diocletian about A.D. 290.

Verona. CONGRESS OF. Meeting of plenipotentiaries of France, Russia, Austria, Prussia, and Great Britain at Verona in 1822. Great Britain was represented by the duke of Wellington. Among the points discussed were the relations of Greece, Turkey, and Russia; the slave trade; the recognition of the new S. American republics; and the question of interference in Spain, where France was desirous of checking a democratic movement against the monarchy. On this matter Austria, Russia, and Prussia declared they would follow France in their diplomatic relations with that country, but Wellington took up an independent line, thus marking the departure of Great Britain from the principles of the Grand Alliance.

Veronal or DIETHYLBARBITURIC ACID, $(C_8H_{12}N_2O_4)$. White crystalline powder. It is an hypnotic, but is not much given now, as it has been responsible for a number of cases of fatal poisoning. The symptoms of poisoning are headache, drowsiness, deep coma, and often a rise of temperature. A rash on the skin may be present, and death may occur in from one to three days. Treatment is to wash out the stomach and give stimulants.

Veronese, PAOLO (1528-88). Italian painter, whose real name was Paolo Cagliari. Born at Verona, son of Piero di Gabriele Cagliari, a decorative sculptor, he studied under his father, and then, having shown a preference for painting, under Antonio Badile. He soon achieved a reputation in historical painting, having painted frescoes for villas at Castelfranco, went to Venice, where he met Titian, and by 1555 became the favourite decorative painter of the day.



Paolo Veronese,
Italian painter
Self-portrait

During 1560-62 he was in Rome, but his grandest works were painted in Venice, 1562-70. The Apotheosis of Venice is the most triumphant of his paintings in the great council chamber. His popular works include the Marriage at Cana (Louvre); the two great mural paintings of the martyrdom of S. Sebastian, in the church of that saint in Venice; The Family of Darius (National Gallery, London); The Supper at Emmaus (Louvre); and other multi-figured scenes that gave scope to his de-

light in sumptuous trappings of dress and architecture. Veronese died April 19, 1588, of pleurisy, in Venice. See Europa; Italy: Art.

Veronica. Genus of shrubs and herbs of the family Scrophulariaceae. They are natives of the N. temperate regions, including Great Britain, and of New Zealand, Australia, and Chile, ranging from a few inches to three feet in height, and bearing white, pink, or blue flowers. They thrive in any ordinary mixture of loam and peat, and are propagated by cuttings taken in spring, or division of the roots of the plants in autumn.

Veronica. Legendary female saint. It is said that, having been healed by Christ, she wiped His face when carrying the cross, and that an image of His features was miraculously imprinted on her kerchief. By its means she is said to have cured and converted the emperor Tiberius. The alleged kerchief is preserved in Rome, though Milan and Jaén also make claim to the honour. The name Veronica is a corruption of Berenice, the saint's name in early forms of the legend.

Verres, GAIUS (c. 120-48 B.C.). Roman provincial governor, notorious for his rapacity and cruelty. His government of Sicily, 73-71, was marked by such a degree of extortion that the inhabitants had him prosecuted at the end of his term of office. The prosecution was entrusted to Cicero, whose speech at the trial in 70 established his reputation as the most promising forensic orator of the day. So overwhelming was the evidence brought forward that Hortensius, counsel of Verres, threw up his brief, and Verres went into exile.

Verrocchio, ANDREA DEL (1435-88). Italian sculptor and painter. Born in Florence, his real name being de' Cioni, he probably studied under Donatello, and after a period in the shop of the goldsmith Giuliano Verrocchio, whose name he assumed, developed into one of the finest craftsmen of the Renaissance. He was the master of Leonardo da Vinci, and Pietro Perugino. He died in Venice. His best-known works are the heroic equestrian statue of Colleoni in Venice, and the bronze David, now in the Bargello, Florence. See Colleoni, B.



Andrea
del Verrocchio,
Italian sculptor

Versailles. Town of France, capital of the dept. of Seine-et-Oise. It stands on a plateau in a district of low wooded hills, 10 m. W.S.W. of Paris, with which there is a rly. connexion. The town is famed for its palace and park, but there are some miscellaneous industries, military and educational establishments, and nursery gardening. The cathedral of S. Louis, founded 1743, and the church of Notre Dame, 1684-86, are noteworthy.



Versailles arms

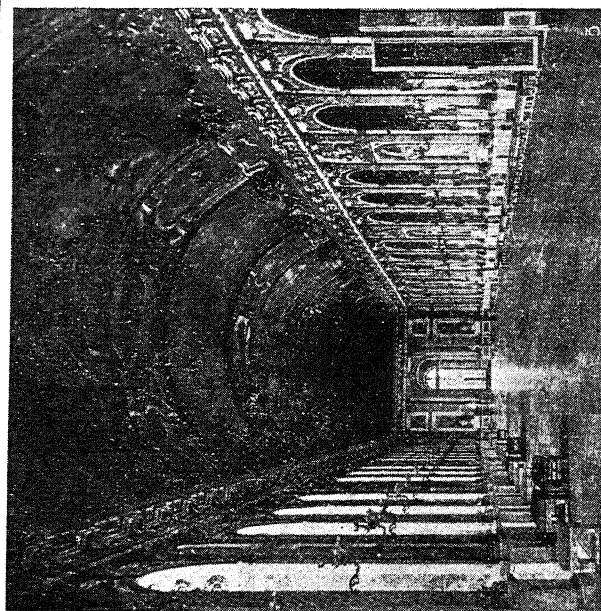
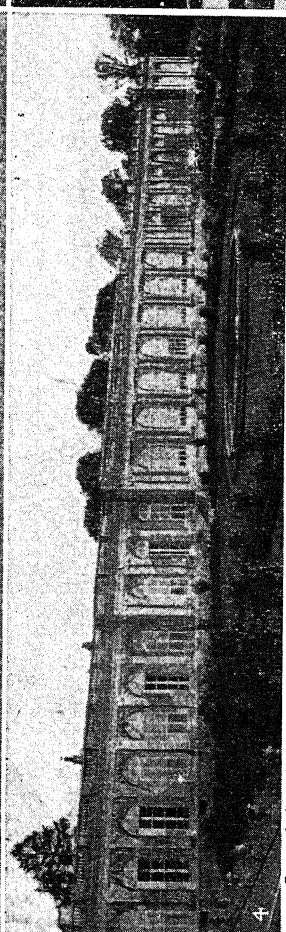
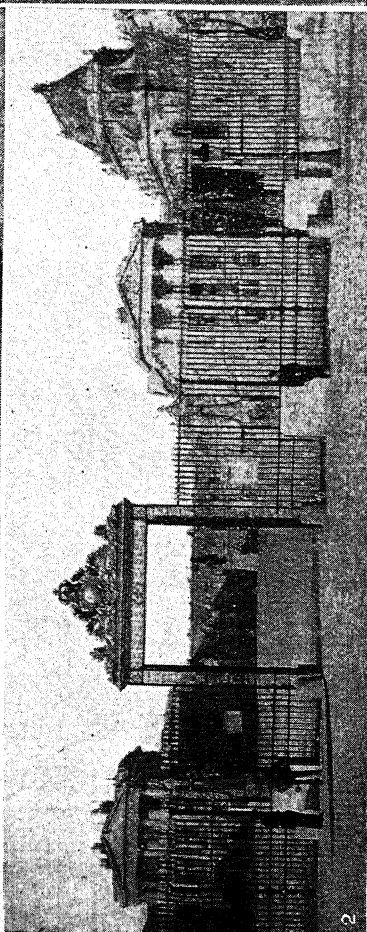
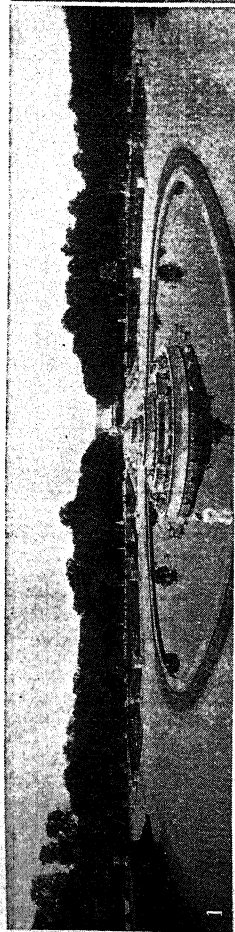
The palace and park lie to the N.W., three main avenues crossing the town to the Place d'Armes in front of the palace. A château of modest size, put up by Louis XIII in 1627, was the centre round which Louis XIV built the enormous edifice which, begun in 1661, became in 1683 the chief royal residence in France. It has a great central Cour Royale, from which depend lateral wings that surpass in length the central block. The chapel, which stands out in the front view by its distinctive style, dates from 1699-1710.

Among the best-known features of the interior are the Galerie des Glaces, in which William I was proclaimed German emperor, and the peace treaty of 1919 was signed; the bedroom of Louis XIV, 1701, and its fine antechamber; and the halls used since 1875 by the senate and chamber of deputies at an election of the president of the republic. There are also picture galleries, historical museum, etc.

The park, laid out by Le Nôtre, is a masterpiece of design, notable especially for its ornamental waters and fountains, the Trianons (q.v.), the orangery by Hardouin-Mansart, 1687, and fine alleys leading up to the Étoile Royale.

Obscure before the advent of Louis XIV, Versailles at his death, 1715, numbered about 100,000 inhabitants. The treaty of 1783, the meetings of the states-general in 1789 and the national assembly, the peace of 1871, voting of the republican constitution, 1875, and the treaty of 1919 are among historic events associated with the town. Pop. 70,141. See Fountain illus.; Louis XIV. Consult V. and the Trianons, P. de Nolhac, Eng. trans. 1906.

Versailles, TREATY OF. Treaty concluded at Versailles, Sept., 1783, between Great Britain on the one hand and France, Spain, and the U.S.A. on the other, thus ending



1. General view of the gardens, from the terrace. In the foreground is the Bassin de Latone, one of the ornamental fountains. 2. Main entrance, looking towards the principal courtyard containing the equestrian statue of Louis XIV. 3. Galerie des Glaces, the sumptuously decorated hall where William I was crowned German emperor in 1871, and

where the treaty of Versailles was signed, June 28, 1919. 4. Grand Trianon, the villa built by Louis XIV in 1687-88 for Madame de Maintenon, and later associated with Napoleon I. 5. Petit Trianon, the smaller villa built by Louis XV for Madame du Barry, and subsequently a favourite resort of Marie Antoinette.

VERSAILLES: THE FAMOUS PALACE NEAR PARIS, INTIMATELY ASSOCIATED WITH MEMORABLE EVENTS IN EUROPEAN HISTORY

the War of American Independence (*q.v.*). Great Britain recognized the independence of the revolted American colonies, though retaining Newfoundland and certain fishing rights. All conquests of any importance on either side were restored, France thus regaining some W. and E. Indian possessions, but giving up New Grenada, St. Vincent, St. Kitts, and other places. Spain held Minorca and the Floridas, but ceded the Bahamas.

Versailles, TREATY OF. International treaty of peace, signed at Versailles, June 28, 1919, between the British Empire, the U.S.A., France, Italy, Japan, Belgium, Bolivia, Brazil, Cuba, Ecuador, Greece, Guatemala, Haiti, Hejaz, Honduras, Liberia, Nicaragua, Panama, Peru, Poland, Portugal, Rumania, Yugoslavia, Czechoslovakia, Siam, and Uruguay on the one part, and Germany on the other. The treaty was ratified Jan. 10, 1920, on which day its clauses came into operation. China, one of the Allies, refused to sign, and the U.S. senate rejected the treaty, so that the U.S.A. was not in the end a participant.

The terms were prepared by the Paris conference, which assembled Jan., 1919. The chief delegates were D. Lloyd George (U.K.), Clemenceau (France), Wilson (U.S.A.). The Germans did not accept the treaty until an Allied ultimatum had been delivered, then signed under protest.

Geographical Changes

The treaty established the League of Nations. Political clauses restored Alsace-Lorraine to France; and gave Posen and W. Prussia to Poland. Plebiscites were arranged to be taken to determine the futures of E. Prussia, Upper Silesia, Slesvig, and Malmédy and Eupen. The Saar Basin was ceded to the League of Nations, pending a plebiscite 15 years later. Danzig was also ceded to the League to become a free port, and Memel for eventual transfer to Lithuania. The German colonial empire was surrendered, mostly to Great Britain and France. Germany recognized the inalienable independence of Austria, Poland, and Czechoslovakia.

Military and naval clauses called for the occupation by the Allies for 15 years of German territory W. of the Rhine, Germany bearing the cost. E. of the Rhine an area of 50 kilometres, and the whole territory W. of the Rhine, were to

be wholly demilitarised. Germany was forbidden to possess any submarines, military or naval air force, tanks, armoured cars, or poison gas. Compulsory military service was to be abolished, and the army limited to 100,000. Heligoland and other fortifications were to be demilitarised and the German fleet surrendered except for 6 small battleships and 30 other craft. New warships could be built only within strict limits and the number of men serving in the German navy was not to exceed 15,000.

Reparations Clauses

In the reparations clauses Germany accepted responsibility for all loss or damage suffered by the Allies in the war, and a payment was required of £1,000 million in gold, goods, or ships before May, 1921, with large subsequent payments over 20 years. Devastated areas in France and Belgium were to be restored at Germany's expense, and all merchant ships of 1,600 tons and over, half of those with tonnage of 1,000–1,600, one quarter of her trawlers and fishing craft, and all ocean cables were to be surrendered. Other clauses demanded the surrender of animals, plant, and art treasures in reparation for those destroyed in the war; the opening of the Kiel canal to all shipping; and the trial "for a supreme offence against international morality" of the German ex-emperor.

Provision was made for the revision of the various clauses of the treaty as occasion demanded.

Almost from the moment of signing many of the most vital clauses of the treaty were a dead letter.

Some were utterly impracticable. The disarmament of Germany was evaded; the problem of reparations payments demanded the constant attention of experts with very little result, and after being defeated by the devaluation of the German mark, they were finally cancelled in 1932; the surrendered German fleet was scuttled at Scapa Flow; the Kaiser was never tried, and the only 12 German "war criminals" to be arraigned, who were of little importance, were either acquitted or escaped with trifling sentences. It was often said that the clauses of the Versailles treaty contained all the seeds of a second war. Above all, Germany resented the treaty's insistence on her guilty responsibility for the war. It was left to Hitler to flout the remaining clauses, to march into the demilitarised Rhineland with-

out protest in 1936; to annex Austria in 1938, and Czechoslovakia and Memel in 1939, to reintroduce compulsory military service (1935), and to rebuild the German air force, and (within the terms of the Anglo-German naval treaty of 1933 which tacitly ignored the provisions of Versailles) the German navy, including a powerful submarine fleet. See Dawes Plan; Germany; League of Nations; Reparations; Saar Basin; Young Plan.

Versailles Council. Allied military committee in the First Great War. It was the military section of the Allied Supreme Council formed in 1917, and it met usually at Versailles. The appointment of Foch to the supreme command made the Versailles Council of little subsequent importance.

Verse (Lat. *versus*, a furrow, from *vertere*, to turn). Universal medium of poetry. It denotes a series of syllables or sounds, ordered and measured in a particular way. The unit of measurement for this flowing or rhythmic movement is usually called a foot, since by the arrangement of these syllabic groups the character of the rhythm is determined; as it is in dancing, with which primitive poetry was associated, by the beat of the foot.

In the classical languages the unit or foot varied according to quantity, *i.e.* the distribution within it of the long and short syllables; but in modern languages the number of syllables and the incidence of the stress or accent determine the nature of the foot and so govern the metre. It is usual, however, in describing English verse to employ the classical terms, and, regarding stressed syllables as long and unstressed as short, to speak of iambic, trochaic, dactylic, or anapaestic verse.

Quantity as a governing principle never established itself in the Romance languages, since they sprang from spoken Latin, which was stressed, rather than from the literary language, to which in poetry the rule of longs and shorts was applied. These languages employed the syllabic principle, by which the number of syllables in the line is the chief determining factor, while the Teutonic peoples, to whom the principle of stress was familiar, since their own alliterative verse was governed by accent, made of that the ruling idea. Chaucer united in English, through his knowledge of French,

the syllabic with the native stress principle, and English poetry has since observed the rule of counting both, each foot containing one stressed and either one or two unstressed syllables, called therefore disyllabic and trisyllabic verse. Add to this rule another, that the natural accent of a word must not, when it is fitted into the rhythmic framework, be tortured or violated, and we have the elementary principles of English metre.

But within the simplest scheme there lie infinite possibilities of musical cadence and ripples of sound, due to alliteration, distribution of vowels, rhyme, and subtle fluctuations and inversions of stress, for which no rules can be prescribed. Rhythm in verse differs from rhythm in prose in that it can be anticipated. In all metres the mind foresees and the ear expects a certain scheme of recurrences, which constitutes the particular measure, and are satisfied when the expectation is met. But, provided that this scheme is sufficiently preserved to answer expectation, continuous and slight departures from it, a variety within the unity, are received with added pleasure. See *Anacrusis*; *Anapaest*; *Dactyl*; *Iambic*; *Spondee*; *Trochee*, etc.; also *Blank Verse*; *Poetry*.

Versicle. In church liturgies, a short verse spoken or sung by the priest and answered with a response by the choir and congregation.

Vers Libre (Fr., free verse). Term applied to poetry which is not based on any set metre or form. The supporters of *vers libre* claim that poetic expression is best achieved by the release of verse from the constricting influence of standard laws and measurements of composition, which tend to produce artificiality and often prolixity, and that the genuine

poetic impulse produces its own individual cadences and literary form. The *vers libriste* doctrines have had wide influence on contemporary poetry.

Verst. Russian linear measure. It is a little less than two-thirds of an English mile, precisely 3,500 ft.

Vert. One of the seven heraldic tinctures, green. It is represented in drawing by thin diagonal lines from dexter chief to sinister base. The French term *sinople* is sometimes used for *vert*. See *Heraldry*, colour plate.

Vertebra. Component bone of the spinal column. In man, the vertebrae are originally 33 in number. Of these, 24 remain movable, while five at the lower part of the spine unite to form the sacrum, and four small terminal bones constitute the coccyx. Each vertebra consists of a short cylindrical part or body, which is connected with the vertebrae above and below by an intervertebral cartilaginous disk. The vertebrae are divided into five groups—cervical, dorsal, lumbar, sacral, and coccygeal. The cervical vertebrae are the first seven, and are the smallest of the movable vertebrae. The dorsal or thoracic vertebrae are twelve in number, and support the ribs. The five lumbar vertebrae are the largest of the movable vertebrae. See *Anatomy*; *Atlas*; *Coccyx*; *Sacrum*; *Spinal Column*.

Vertebrates (Lat. *vertebra*, a joint). Group of the animal kingdom which includes all those animals that possess a backbone. It comprises the fishes, amphibians, reptiles, birds, and mammals, taking in about 32,000 recognized species. The phylum Chordata includes the vertebrates, and other forms which have a smooth elastic rod, called the notochord, instead of a jointed vertebral column. See *Animal*, colour plate.

Vertigo. Sense of instability and rotatory movement of the surroundings of the body. See *Giddiness*.

Vertue, GEORGE (1684–1756). English engraver and antiquary. He was apprenticed to an engraver



George Vertue,
English engraver
After J. Richardson

in London, and in 1709 was employed by Kneller to reproduce some of his portraits. Vertue brought out some 500 engraved portraits for books and plates, and travelled widely in England, taking notes and making sketches of places of historical interest. In 1717 he became engraver to the Society of Antiquaries. He died July 24, 1756. Among his principal works are the *Historic Prints* taken from Tudor pictures. He also collected material for a history of art which, bought by Horace Walpole, formed the foundation of that writer's *Anecdotes of Painting in England*. See *Savoy illus.* p. 7338; *Stow, John*; *Throgmorton, Sir N.*

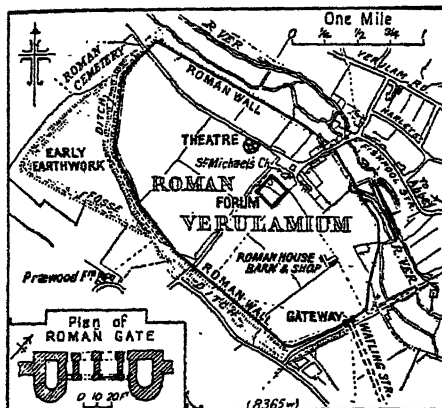
Verulam. Town of Natal. It is 19 m. by rly. N.N.E. of Durban, is situated about 7 m. from the coast, and is the centre of important sugar, fruit, and tobacco plantations. Pop. est. 1,300.

Verulam, EARL OF. British title held since 1815 by the family of Grimston. William Lukyn (d. 1756), M.P. for St. Albans, having succeeded to the estates of his kinsman, Sir Samuel Grimston, Bart., took that surname. In 1719 he was made an Irish peer as Viscount Grimston. His descendant, James, 4th viscount (1775–1845), was made earl of Verulam in 1815. From him is descended the 5th earl, James Brabazon (b. Oct. 11, 1910). The earl is also a Scottish peer as Baron Forrester. An eldest son is known as Lord Forrester of Corstorphine, and the family seat is Gorhambury, St. Albans. See *Bacon, Francis*; *Gorhambury*.

Verulamium. Ancient British town in Herts, England, on the W. side of St. Albans. It was the capital of Tasciovanus, father of Cunobelinus (Cymbeline), and continued to grow and flourish after the Roman conquest of A.D. 43. It was destroyed by Boadicea in 61, but rose again and remained one of the chief towns of Britain until its decay and desertion at the time of the Anglo-Saxon invasions.



Verulamium. Foundations of main Roman gateway, as excavated 1930 near St. Albans, Herts. See also *Archaeology illus.*; *Roman Remains illus.*



Plan of Roman Verulamium, near St. Albans, Herts

Its successor grew up beside the abbey built in commemoration of one of its citizens, S. Alban (see St. Albans). Large-scale excavations begun by Dr. and Mrs. Mortimer Wheeler in 1930 revealed temples, houses, fine mosaics, and the bases of two triumphal arches. The site of part of the Roman city is now a public park, and the theatre has been preserved.

Verviers. Town of Belgium, in the prov. of Liège. It lies on the Vesdre, 17 m. by rly. E. of Liège, and has two rly. stations. The main industry is in wool; chocolate, confectionery, and leather industries are also carried on. The origin of Verviers is traced to the 7th century; it was owned by the margraves of Franchimont and obtained a charter in 1651. It was occupied by the Germans in the First and Second Great Wars. Pop. est. 40,296.

Vervins. Town of France, in the dept. of Aisne. It stands in the Vilpion valley, on the Laon-Hirson rly. line, 24 m. by rly. N.E. of Laon. There are textile industries, notably sack making. Vervins was the old capital of Thiérache, a dist. of Picardy, and was burnt by the Imperial army in 1521. The Germans held it for most of the First and Second Great Wars. The treaty of Vervins, 1598, was signed by Henry IV of France and Philip II of Spain, the latter restoring Calais, Ardres, Le Catelet, and other acquisitions to France.

Very Light. Type of firework much used for military, aerial, and naval signalling by showing a coloured light. The signals, fired from a special large-bore pistol, are made up in cardboard cartridges with a brass base, which contain a charge of black powder as the

propellant and above that a coloured star, a package of composition similar to that used for flares. A piece of quick-match and priming of mealed powder enable the star to be ignited from the propellant. See Fireworks.

Vesicant (Lat. *vesica*, blister). Medicinal agent used to produce blisters as counter-irritants to inflammation, e.g. cantharides. The term is also applied to gases used in warfare, which produce blisters on the skin. See Chemical Warfare.

Vesicle. In medicine, small swelling on the skin containing serum. It is characteristic of certain eruptive diseases, e.g. chicken-pox, herpes.

Vesle. River of France, in the depts. of Marne and Aisne. It rises N. of Châlons-sur-Marne and flows N.W., joining the Aisne 6 m. due E. of Soissons. In its valley there was fighting in connexion with the German thrusts for Paris and the Allied counter-offensive of 1918. See Aisne; Marne. Pron. Vail.

Vesoul. Town of France, capital of the dept. of Haute-Saône. It lies on the river Durgeon, 39 m. by rly. W. of Belfort, and is a rly. junction. There is an agricultural trade, and files, paper, emery paper, and foodstuffs are manufactured. The 18th century church of S. George and palais de justice are notable. Vesoul suffered in the wars of the 14th century, and later in the French and Spanish wars, changing hands several times in 1569. It passed to the French by the treaty of Nijmegen, 1678. In occupied France from June, 1940, it was the scene of heavy fighting when U.S. troops of the 7th army reached it Sept. 11, 1944, in the Allied advance, against fierce German resistance, towards the Belfort Gap. Pop. 11,825.

Vespasian (A.D. 9-79). Roman emperor, 69-79, whose full name was Titus Flavius Sabinus Vespasianus. A

man of obscure family, born Nov. 18, 9, he rose to high military commands in Germany and Britain, and was in charge of the war against the Jews dur-

ing the confusion which followed the death of Nero in 68. On July 1, 69, he was proclaimed emperor by his troops, and his general Primus defeating in Italy the forces of the reigning emperor Vitellius, Vespasian came to Rome in 70, leaving his son Titus to continue the war against the Jews.

Vespasian was above all a soldier, whose reign was marked by further extension of the Roman power in Britain, where N. Wales and Anglesey were annexed, and the rebellion started by the dead Boadicea put down. There was heavy fighting also in Germany, where the Roman dominion was further consolidated. At home, Vespasian devoted himself largely to setting in order the finances of the empire, which had suffered grievously under his extravagant predecessors. Economies, however, did not prevent him from erecting numerous public buildings; he began the Flavian amphitheatre, and built the magnificent temple of Peace. He died June 23, 79. See Colosseum; Rome; Sesterce. Consult V. and some of his contemporaries, C. Longford, 1928.

Vespers. Sixth canonical hour of the divine office as given in the breviary of the R.C. church. It consists of psalms, lessons, hymns, etc., varying day by day through the year, and is recited daily by all clergy and religious of both sexes. The term is also loosely applied to any evening service in church. The Sicilian Vespers (q.v.) was a massacre of the French conquerors of Sicily, at Palermo, Mar. 30, 1282.

Vespucci, Amerigo (1451-1512). Italian navigator. Born in Florence, March 9, 1451, he was educated in that city and was employed in the business house of the Medici. In 1492 he set up for himself at Seville and entered into the commerce then begin-



Amerigo Vespucci, Italian navigator

ning with the New World. He made several voyages thither in Spanish and Portuguese vessels, and gained acquaintance with the little-known coasts of S. America. He spent the remainder of his life making charts and maps of the New World, and died in Seville, Feb. 22, 1512.

During his voyages, which were described in a now lost letter to the Medici family, Vespucci appears to



Vespasian, Roman emperor

have explored the N.W. coast of the S. American continent, which he was stated to have visited June 16, 1497, eight days before the arrival of Cabot. On the publication of his travels, by Martin Waldseemüller, 1507, a public claim was made that Vespucci had discovered the mainland, which was accordingly named after him, and though the matter was long in dispute and has latterly been decided against him, Amerigo's name, originally given to a small strip of land on the Gulf of Mexico, was eventually extended to the whole of the New World. *Consult* A. V.: Pilot Major, F. J. Pohl, 1945. *Pron.* Vespootchee.

Vesta. In Roman mythology, Italian goddess of the hearth. She was later identified by the Romans with the Greek goddess Hestia, whose attributes were similar. The worship of Vesta was a recognition of the supreme importance of fire in primitive communities. A temple, the Atrium Vestae, was maintained in her honour in the Forum. According to tradition, this sacred fire was brought from Troy by Aeneas (*q.v.*).

Vesta. One of the asteroids. It was discovered by Olbers, March 29, 1807, the fourth in order to be found, and is the brightest known of the asteroids. It can occasionally be seen by the naked eye and has an approximate diameter of 240 m. It revolves round the sun in about 1,326 days. *See* Asteroids.

Vest Agder. Fylke or co. of Norway, formerly known as Lister and Mandal. It terminates in the



Vestal Virgin. A statue of a priestess in the National Museum, Rome

Naze (Lindesnaes) and has an indented coast on the North Sea. Christiansand is the chief town. The area of the co. is 2,793 sq. m. Pop. 93,326.

Vestal Virgin. Priestess of the temple of Vesta in ancient Rome. The Vestal virgins were six in number, entered the service of the goddess at from six to ten years of age,

and were either offered by their parents or chosen by lot from families selected by the Pontifex Maximus. Service lasted for thirty

years in all, after which period they were free to return to civil life. During their service they were vowed to chastity, and if they broke this vow they could be buried alive by the Pontifex Maximus. Their chief duty was the maintenance of the sacred fire in the temple. The vestal virgins were abolished by Theodosius in 394. *See* Rome; Vesta.

Vesteraalen Islands. Name sometimes applied to Andö, Hindö, and Langö, the three largest of the Lofoten Islands (*q.v.*).

Vesterbotten OR VÄSTERBOTTEN. Län or co. of Sweden; the central co. of Norrland. It lies between Norrbotten on the N. and Jamtland and Västernorrland on the S., and between Norway and the Gulf of Bothnia. Lumbering is the chief industry. Umeå is the capital. The area of the co. is 22,839 sq. m. Pop. est. 228,627.

Västernorrland OR VÄSTER-NORRLAND. Län or co. of Sweden. It lies between Jamtland and the coast of the Gulf of Bothnia, and between Vesterbotten and Gefleborg. Lumbering is the chief industry. Wood pulp is exported from Hernösand the capital, Sundsvall, and other ports. The co.'s area is 9,925 sq. m. Pop. 274,080.

Vestfold. Fylke or co. of Norway, formerly known as Jarlsberg and Larvik. It lies on the W. side of Oslo Fjord, opposite Östfold. Larvik is the chief town. Its area is 903 sq. m. Pop. 145,027.

Vestigial Structure. Any part of the body which, once in full function, now remains only in trace and without use. Such are the appendix in man, once an active part of the intestinal tract, as it still is in the horse; and the pineal eye, a rudimentary eye, now useless, in certain lizards.

Vesting Order. Order made by an English court, generally by the chancery division, transferring the legal estate in any kind of property to a person equitably entitled to it. Such an order often saves much time and trouble and the cost of many deeds and documents.

Vestmanland OR VÄSTMAN-LAND. Inland län or co. of Sweden. It extends N. from Lake Mälär to Kopparberg between Uppsala and Örebro. Iron is mined in the W. and N., and silver has been mined at Sala since the 15th century; pig iron and iron goods are produced in several towns. The area is 2,611 sq. m. Pop. est. 187,198.

Vestments (Lat. *vestire*, to clothe). In an ecclesiastical sense, garments worn by clergy, choir,

and their assistants over ordinary dress during divine service. Vestments worn by officiating clergy are sometimes called canonicals, because prescribed by canon law. Particular references will be found under the entries alb, amice, cassock, chasuble, chimere, cope, dalmatic, hood, maniple, mitre, rochet, stole, surplice, etc. The idea that clerical vestments were derived from Jewish practice has given way to the view that they had their origin in the ordinary dress of the Roman empire, being originally, however, of more costly material, and usually white, though scarlet stripes on the deacon's dalmatic were known in the 10th or 11th century, and black was used for mourning and on certain other occasions. *See* Ornament; Ritualism.

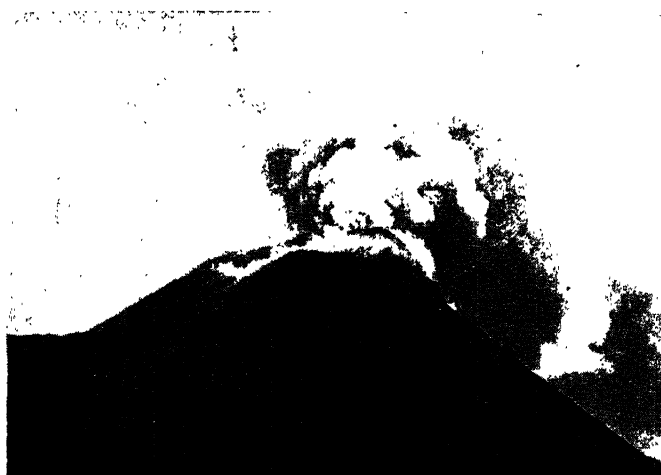
Vestris, GAETANO (1729-1808). Italian dancer and choreographer. This Florentine made his début at the Paris Opera in 1748 and was *maître de ballet* there during 1770-76. With his extensions to the technique of male dancers, he ranks among the creative figures of ballet. His wife, Anna Heiner (1752-1808), was the inventor of the pirouette.

Vestris, LUCIA ELIZABETH (1797-1856). British actress and opera-singer. Daughter of Gaetano Bartolozzi (1757-1821), engraver, she was born in London. In 1813 she married the Italian dancer Auguste Armand Vestris (1787-1825), from whom she separated in 1816. A year earlier she made her first appearance in opera. She acted in Paris, 1816, at Drury Lane, 1820, and won popularity in light comedy and burlesque in London and the provinces. In 1831, with Maria Foote, she opened the Olympic Theatre, London, and in 1838 married Charles James Mathews, with whom she visited the U.S.A. and assisted in the management of Covent Garden Theatre, 1839-42, and the Lyceum Theatre, 1847-54. Retiring in 1854, she died Aug. 8, 1856.



Lucia Vestris, British actress

Vestry (Lat. *vestiarium*, wardrobe). Room attached to a church in which the vestments are kept. Qualified parishioners used to meet in vestry to consider parish affairs, and the name was applied to the meeting itself. The vestry in this sense now consists of the



Vesuvius. The Italian volcano on the shore of the Bay of Naples seen during a minor eruption

incumbent, the ratepayers, and occupiers of rated premises. At one time the vestry exercised wide powers, secular as well as ecclesiastical; e.g. they elected parish officials such as the assessor and collector and surveyor of highways. They have long since lost their secular powers, and the ecclesiastical have been greatly reduced. In 1921 all authority over affairs of the church, except the election of sidesmen and churchwardens and the administration of charities, was transferred to the parochial church council; and in 1933 in urban areas any remaining powers were with similar exceptions given to the borough or urban district council. See Ecclesiastical Law.

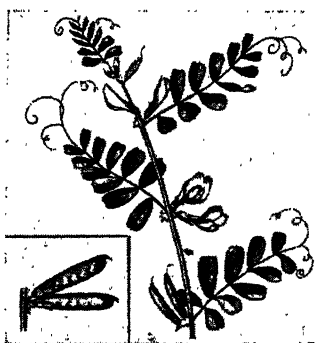
Vesuvianite. Alternative name for the mineral idocrase (*q.v.*).

Vesuvius. Volcano in Italy. It rises to a height of about 3,890 ft., 10 m. E.S.E. of Naples, on the shore of the Bay of Naples. It is a solitary height about 30 m. round, the base rising from the plain of Campania, and has two summits, the nearly perfect cone of Vesuvius and the old semicircular ridge of Somma which encloses the central cone.

The mt. is composed of tuffs or volcanic ashes, interstratified with lava flows. Among ejected blocks found on its slopes are pieces of Apennine limestone derived from the underlying basement rocks. Before A.D. 79 the crater formed a deep depression, and its slopes were obscured by thick forests. The vicinity was thickly peopled, as its volcanic nature was not suspected. On Aug. 24, 79, an eruption destroyed the top of the

mt., and Pompeii and other towns were buried under ashes, while Herculaneum was overwhelmed by a torrent of mud.

Subsequent explosions occurred at later dates; in 472 ashes reached Constantinople, and in 1036 the first outflow of lava appeared. In more recent eruptions the shape and size of the mountain have been modified, and in the intervals between them the



Vetch. Spray of flowers and leaves of *Vicia sativa*; inset, seed pods

inhabitants of the dist. have encroached on the dread area only to suffer; 18,000 people perished in 472, Torre del Greco suffered in 1631, 1794, and 1861, Torre Annunziata and other villages in 1631 and 1906.

A wire rope rly. connects the summit with the base; an observatory is maintained near the cone, whence warnings are issued of variations in the crater's quiescent condition, and expeditions start to investigate the problems of volcanism and seismography. Vesuvius and neighbouring volcanoes indicate a line of

fracture or weakness in the earth's crust, which marks the E. edge of the sunken land below the basin of the W. Mediterranean. Grapes are grown on the slopes for the wines *lacrima Christi* and *vino greco*. See Cone; Crater; Naples; Volcano. Consult Volcanoes, G. W. Tyrrell, 1931.

Veszprém. Town of Hungary, capital of the co. of the same name. It is 60 m. S.W. of Budapest and 7 m. N.W. of Lake Balaton. It is the seat of a bishop, and has a 14th century cathedral. Wines and fruit are produced in the locality. During the Second Great War it was captured from the Germans by Tolbukhin's 3rd Ukrainian army March 24, 1945, during a rapid advance to the S.W. of Budapest.

Vetch OR **TARE** (*Vicia sativa*). Annual herb of the family Leguminosae, the commonest of the British wild vetches. Widely cultivated as a fodder plant, it has several stems, with alternate leaves divided into five or six pairs of oval or oblong leaflets, and ending in tendrils by means of which the plant climbs up grass stems, etc. The pale purple stalkless flowers are either solitary or in pairs, and the long-slender pods are slightly hairy. See Kidney Vetch.

Veterinary Science. Science of treating the diseases of domestic animals. Formerly confined as a rule to diseases of animals bred for work, food, or sport, e.g. horses, cattle, sheep, pigs, and dogs, it was later extended to those of all pets, including birds. The main infectious diseases from which animals suffer, and which are treated by veterinary science, are rabies and distemper, peculiar to dogs; swine fever and swine erysipelas, in the pig; braxy and louping ill, peculiar to sheep; rinderpest and bovine pleuropneumonia that affect only cattle; and strangles and S. African horse sickness (only horses). Others, which attack more than one species, are quarter ill, glanders, actinomycosis, tetanus, foot-and-mouth disease, tuberculosis, anthrax, all except the first communicable to human beings.

This science is said to owe its origin to the Roman writer, Vegetius, who lived c. 300, and has been practised empirically by agriculturists of all countries and all ages, but not until the 18th century was it systematically studied. In 1761 a veterinary college was founded at Lyons, and the vast increase in scientific

knowledge that marked the 19th century made possible the veterinary surgeon of today. A portion of sums invested on totalisator betting at horse races may be devoted by the betting control board to veterinary science.

Veterinary Surgeon. One who studies the diseases of animals (including birds) and their cure. In



Royal College of Veterinary Surgeons arms

the U.K. the governing body in veterinary surgery is the Royal College of Veterinary Surgeons, incorporated by royal charter in 1844. The college is governed also by later charters and by several Acts of parliament, the most important of which are the Veterinary Surgeons Acts of 1881 and 1948. The college keeps a register of all persons who have qualified by passing its examinations or by holding degrees in veterinary science in certain universities approved for that purpose by the privy council. The council also keeps a supplementary register of persons not thus qualified but who, before the coming into full operation of the 1948 Act, were at least 28 years of age and had satisfied the council that they were of good personal character and had during the ten years preceding application for a total of seven years been engaged as their principal means of livelihood in diagnosing diseases of animals and giving them medical or surgical treatment. The period of seven years might be reduced for the benefit of persons in war service or work of national importance. A person not in either register is not allowed to practise veterinary surgery under penalty of £100 fine.

Unqualified persons may, except in certain cases, treat animals owned by themselves or by their employers or by members of their own household, and may render first aid. There are certain wider exemptions for persons engaged in agriculture. Employees of animal welfare societies may also be licensed by the ministry of Agriculture to give certain medical or other treatment or to perform specified minor operations in order to relieve pain.

A person not on the main register must not use the title veterinary surgeon and a person neither on the main nor on the supplementary register must not use the

title veterinary practitioner. Nor must a person use any name, title, description, etc., for himself, his business, or his premises calculated to lead to the belief that he has veterinary qualifications that he does not in fact possess.

The council acting through its disciplinary committee may remove the name of any person from either register on certain grounds—e.g. misconduct. An appeal lies to the high court. A practising veterinary surgeon is exempt from jury service.

The oldest school for the science in the U.K. is the Royal Veterinary College at Camden Town, London, N.W.1, founded in 1791. Affiliated to it are schools at Edinburgh, Glasgow, Dublin, Liverpool, Bristol, and Cambridge. See Royal Army Veterinary Corps.

Veto (Lat., I forbid). Term for the power of checking proposed legislation possessed by a king or body of men. In Great Britain the sovereign has not used his right of veto since 1707, and some authorities think that it has lapsed. In parliaments of two houses, one usually possesses the right of vetoing legislation passed by the other, and this was so in the U.K. until 1911. The Parliament Act that year reduced the lords' power of veto to two years. The Labour govt. introduced in 1947 a bill reducing the lords' veto to one year; thrice passed by the commons, thrice rejected by the lords, it received the royal assent, Dec. 16, 1949. The U.S. president has a veto on all legislation, unless the two houses jointly pass a vetoed measure by a majority of two-thirds. In the British dominions the only veto is that of one house over the other. The term veto was applied to the rule in the U.N. security council under which a negative vote by one of the five permanent members (U.K., U.S.A., U.S.S.R., France, China), outweighed any number of positive votes. Russia's use of the veto reduced the work of the security council virtually to nil. See *Liberum Veto*; *Parliamentary Act*; *United Nations*.

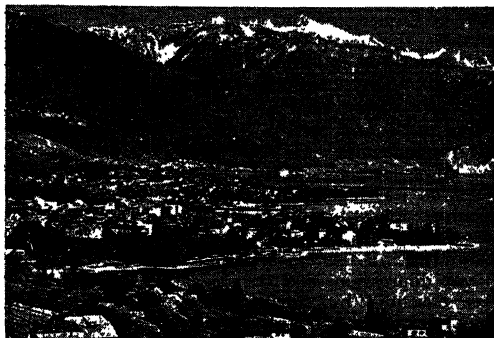
Vevey. Town and tourist resort of Switzerland. In the canton of Vaud, it stands on the

Veveyse, near its mouth on the Lake of Geneva, 11 m. by rly. E.S.E. of Lausanne. Steamers go from here to other places on the lake, and there is a funicular rly. up Mont Pélerin. Pop. 12,598.

Vexatious Indictment. Legal term for an indictment laid maliciously and without any possible grounds. At common law anyone could prefer an indictment to a grand jury against anyone. This power was restricted by the Vexatious Indictments Act, 1859, in regard to certain offences. In 1933 grand juries were abolished, and no indictment could be preferred unless the accused had been committed for trial or consent obtained from a high court judge; or, in the case of perjury, under the order of the person presiding over the court where perjury is alleged to have been committed.

Vexjö, VÄXJÖ, OR WEXJÖ. City of Sweden, in the co. of Kronoberg. It is 58 m. direct W.N.W. of Kalmar, and has rly. connexions with Kalmar and Karlskrona. The 14th cent. cathedral is the chief building. There are iron foundries and match factories. Pop. 16,236.

Vézelay. Village of France. In the dept. of Yonne, it stands on a hill overlooking the valley of the Cure, 9½ m. W.S.W. of Avallon. A Benedictine abbey, founded in the 9th century, acquired the alleged relics of S. Mary Magdalene, and became a famous place of pilgrimage. Here, in 1146, the Second Crusade was initiated by the council convoked by Louis VII, and in 1189 Richard Coeur de Lion and Philip Augustus met before setting out on the Third Crusade. The sentences of Vézelay were promulgated by Becket against his opponents. The Romanesque abbey church of S. Madeleine, restored by Viollet-le-Duc, has a fine 11th cent. nave and Gothic sculptures. Prosperous in the Middle



Vevey, Switzerland. View of this tourist resort near the mouth of the Veveyse, on Lake Geneva

Âges, Vézelay is still surrounded by walls a mile in circuit.

Vézère. River of France, in the depts. of Corrèze and Dordogne. It rises in the Monts du Limousin, N. of the Puy de Meymac, and flows through a rocky valley in a S.W. direction to meet the Dordogne at Limeuil, joining the Corrèze near Brive. Among the towns on its banks are Uzerche, Terrasson, Le Bugue. Its length is 115 m.

Via Dolorosa (Lat., sorrowful road). Name, probably given during the Middle Ages, of a narrow street in Jerusalem, indicated by a doubtful tradition as the way along which Jesus carried His cross from the hall of judgement to Calvary. The 14 stations are marked by tablets. The term is applied also to this journey of Jesus, and in that sense was a favourite subject of the old masters, e.g. Raphael, Ghirlandajo, Ribalta.

Viaduct (Lat. *via*, way; *ducta*, led). Elevated structure, supported usually on arches, for carrying a road or rly. across a river, valley, or gorge. See Aqueduct; Holborn; Luxemburg illus. p. 5338.

Via Mala (Lat., bad road). Road in Switzerland, in the canton of Grisons. It occurs on the route over the Splügen Pass in a mt. gorge in the valley of the Hinter Rhine. Four m. in length, it passes between almost vertical limestone cliffs 1,600 ft. high, and crosses ravines by three high bridges, and in parts there are galleries and tunnels. Originally made in 1470, it was reconstructed with a width of 21 ft., 1818-24.

Vian, Sir Philip (b. 1894). British sailor. From Dartmouth he entered the navy, and achieved



Sir Philip Vian,
British sailor

celebrity in the Second Great War by rescuing in 1940 300 British seamen from the German prison ship *Altmark* (q.v.) when, as a captain, he commanded the destroyer *Cossack*. As an admiral he was in charge of convoys which ran the Malta blockade in 1942. Vian later covered the Sicilian and Salerno landings, 1943. He commanded the 1st aircraft carrier squadron in the Pacific during 1944-45, later becoming second-in-command of the British Pacific fleet. Appointed 5th sea lord, 1946, and deputy chief of naval staff (air),

1947, he was promoted admiral of the fleet, 1948, and appointed C.-in-C. home fleet, 1950. He was awarded the D.S.O. with two bars and was knighted in 1942.

Vianna do Castello. Dist. of Portugal, in the prov. Entre Minho e Douro. It has an Atlantic seaboard and is bounded on the N. by the Minho. The fisheries, salmon in the rivers, tunny and sardines in the sea, are valuable. Area, 814 sq. m. Pop. 258,596.

Vianna do Castello. Town and port of Portugal, capital of the dist. of the same name. It is at the mouth of the Lima river, 45 m. by rly. N. by W. of Oporto. Defended by the old Castello do S. Thiago, it is adorned by a Renaissance town hall, a cathedral, and other churches. The Campo da Agonia is a place of pilgrimage. Pop. est. 11,000.

Viareggio. Port and bathing resort of Italy, in the prov. of Lucca, Tuscany. It is 13 m. by rly. N.W. of Pisa and 33 m. by rly. S.E. of Spezia. Shelley's body was washed ashore here and cremated on the beach in 1822. There are shipbuilding yards and a school of navigation. In the Second Great War it was captured by the Allied 5th army Sept. 16, 1944. Pop. est. 28,000.

Via Sacra (Lat. sacred way). One of the most important streets of ancient Rome, probably so called from the numerous sacred monuments on it or in the neighbourhood. Beginning at the Capitoline Hill, it went past the Basilica Julia, and the temple of Castor and Pollux, crossed the Forum, ran along the N. of the temple of Julius Caesar, passing the temple of Antoninus and Faustina and the basilica of Constantine on the other side, and the arch of Titus at the S.E. end of the Forum, and thence to the Colosseum. During the empire the Via Sacra was carried as far as the Esquiline Hill.

Viaticum (Lat., provision for a journey). Administration of the Holy Communion to the dangerously sick or dying. The R.C. Church has a special formulary for this office, which is provided for in the Church of England by directions for The Communion of the Sick. In the ancient Church, both baptism and the Holy Eucharist were called Viatica.

Viborg. Town of Denmark, capital of the eo. of the same name in Central Jutland. It is on the lake of Viborg, 38 m. N.W. of Aarhus and 140 m. N.W. of Copenhagen. The Romanesque granite cathedral, built 1130-69,

was rebuilt 1864-76; the bishopric dates from the 11th century. Pop. 20,084.

Viborg. Swedish name of the Karelo-Finnish town of Viipuri (q.v.).

Vibration. Regular oscillation or reciprocating motion set up in ether or matter by various forces. Such is the vibration of a violin string, the air of an organ pipe, etc. The simplest type of periodic vibration is known as a simple harmonic motion, and a vibration, or oscillation, or cycle, refers to a complete to-and-fro motion. The number of vibrations made by a body in one sec. is termed its frequency. See Ether; Heat; Light; Radio-activity; Wave; X-Rays.

Vibrator. Electrical device used in converting D.C. to A.C. Vibrators are used where radio sets are to be operated off a low-voltage battery, without a separate H.T. supply (e.g. car radio sets). They incorporate a vibrating reed carrying contacts and operated by a magnet coil in a similar manner to an electric bell or buzzer, so that the D.C. circuit is rapidly made and broken, producing a pulsating current. This can be applied to a transformer and stepped up as required, producing a high-voltage A.C. at the transformer secondary. This can then be applied to an ordinary rectifier, and re-converted into high-voltage D.C. Certain types of vibrator are arranged with additional contacts on the reed to which the A.C. supply is connected, being then rectified once more; the net effect is that D.C. can be transformed from one voltage to another in the small currents required for radio work with apparatus considerably smaller and simpler than a motor-generator set, which would otherwise be necessary. The term has also been used (as an alternative to trembler) for any form of vibrating contact.

Vicar (Lat. *vicarius*, deputy). In the Church of England, any incumbent of a parish, not a rector, entitled to solemnise marriages and keep the fees. Theoretically, the owner of the tithes is the rector, and the vicar is his deputy. Owners of tithes may be ecclesiastical corporations or laymen, to whom or to whose predecessors the great tithes of a parish have been granted. The vicarage is, strictly, the term used for the benefice, including house, glebe, fees, and offerings. It is commonly applied to the vicar's residence. Vicars-choral are the assistants of the canons or prebendaries of collegiate churches,

especially in connexion with the musical parts of divine service. In the R.C. Church, a vicar is one who represents the pope or bishop. One of the titles of the pope is Vicar of Jesus Christ. See Bishop; Curate; Ecclesiastical Law; Rector.

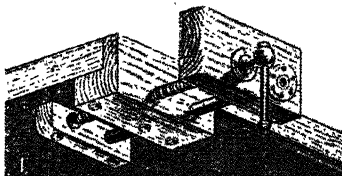
Vicar-General. Lay legal officer who acts as deputy of the archbishops of Canterbury and York in granting marriage licences: the institution of benefices, and the confirmation of bishops. He has under him a registrar, an apparitor, and chief clerk and record keeper. His office is 1, The Sanctuary, Westminster, S.W.1. Thomas Cromwell was appointed the king's vicar-general, vice-gerent, and chief commissary by Henry VIII in 1535; he was the only holder of that office.

In the R.C. Church, a bishop may appoint two or more vicars-general to assist him, and may assign to each jurisdiction over a particular district, or commit to one charge of contentious matters, to another voluntary jurisdiction, or give them all joint and full jurisdiction over the whole diocese, apart from offices coming under pontificalia.

Vicar of Bray. Title of a song written in the time of George I by an officer in the British army. Though telling of a vicar, supposedly of Bray, Berks, who lived in the reigns of Charles II, James II, William III, Anne, and George I, and who yet by change of faith retained his living, it is said to have in mind Simon Alleyn, or Aleyn, vicar of Bray, 1540-88. During the reigns of Henry VIII, Edward VI, Mary, and Elizabeth, he remained vicar by faith changing his other between R.C. and Protestant.

Vicar of Wakefield, THE. Prose tale by Goldsmith, published 1766. The vicar, Dr. Primrose, narrator of the story, is by nature an admirer of human happy faces, and a firm believer that it is unlawful for a clergyman of the Church of England to marry twice. In addition to Deborah Primrose, his wife—for pickling, preserving, and cookery none could excel her—the characters include George, their eldest son; Olivia, open, sprightly, and commanding—victimised by Squire Thornhill; and Sophia, soft, modest, and alluring—who wins Sir William Thornhill, alias Mr. Burohell.

Vice. Implement with two jaws between which an object may be gripped and held fast while work is done upon it. The jaws may be held open by a spring, as in the watchmaker's pin-vice, or in the blacksmith's leg-vice, which is

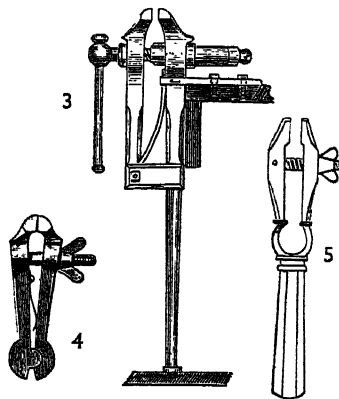
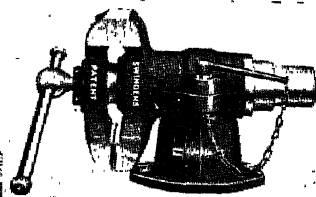


bolted to a bench but has also a leg affording support from the floor. The pin-vice is formed from a single piece of steel, thinned down below the jaws to furnish the springy bow-shaped portion. In the leg-vice a separate spring between the jaws keeps them apart until the screw is operated to bring them together. A defect of both types is that the jaws open and close at an angle; the early-pattern hand-vice has the same drawback.

Vices used by engineers are made with a parallel action; one jaw usually is an integral part of a heavy slide which moves in and out horizontally in a socket of the base plate of which the other (fixed) jaw forms an integral part. The jaws are brought together by a screw of deeply cut square thread or buttress thread. In the pin-vice and hand-vice the screw is stationary, and a wing-nut applies pressure. In bigger types the nut is stationary, formed in the casting of the fixed jaw; the screw is turned with a tommy-bar to operate the movable jaw. In other vices the movable jaw is closed in by hydraulic action. Air-operated vices are used where a workshop has compressed air available for other tools.

The simplest vice used by woodworkers consists of two oblong plates of beechwood, one screwed to the face of the bench and the other moving horizontally on guide-rods. A stout screw of beech brings the loose jaw against the fixed one. A steel screw and nut are often used along with wooden plates. All-metal joiners' vices are taking the place of the earlier type. In these the complete vice, with steel or other metal jaws, is screwed or bolted to the bench. Often there is a quick-release action, so that work can be freed without running the screw back. Metal workers' vices also are made with quick-release.

Vice-Admiral. Officer in the British navy, next in rank above a rear-admiral. Upon his cuff he wears one broad gold stripe, with two narrow gold stripes above it, the upper stripe having a curl. His flag is the St. George's Cross with



Vice. Patterns in common use. 1. Carpenter's bench vice, with wooden jaws. 2. A revolving head and base vice. 3. Loose-jawed vice, with tail attached to floor. 4. Hand vice. 5. Pin vice.

No. 2 by courtesy of Abbots, Birks & Co.

one red ball in the upper right-hand corner: The equivalent rank in the army and air force is lieutenant-general and air marshal respectively. See Royal Navy colour plate.

Vice-Admiralty Court. Tribunal formerly established in British possessions, holding jurisdiction over maritime matters. These courts were appointed under the great seal, and by an Act of 1863 dealt with all kinds of claims, piracy, prizes, etc. The Act was repealed in 1890, and the vice-admiralty courts were superseded by courts set up in the various colonies, which exercises unlimited jurisdiction in all Admiralty matters.

Vice-Chancellor. Deputy of a chancellor. In the English legal system, the vice-chancellors, originally assistants to the lord chancellor, became prominent equity officials. The title was discontinued in 1873, and the last vice-chancellor was Sir James Bacon (1798-1895). The judge of the court of the duchy of Lancaster is called the vice-chancellor. The office is an important one in English and other universities, where the vice-chancellor, as representing the chancellor, is the acting head of the university. At Oxford and Cambridge he is selected according

to seniority from among the heads of houses; normally he serves for four years. The death in office of W. F. S. Stallybrass, vice-chancellor of Oxford, in 1948, created a situation without precedent. At Manchester, Leeds, and other universities the official is appointed for life.

Vicente, GIL (c. 1470-1540). Portuguese dramatist. A native of Guimarães, he studied law at Lisbon university, but turning to literature, became attached successively to the courts of Manoel I and John III, for whom he provided dramatic entertainments. He wrote 44 plays, some in Spanish, some in Portuguese, and others in both. His work, representing the transition from the medieval to the modern drama, consists of religious plays, including the famous *Auto of the Soul*, 1508, tragicomedies for the court, and popular comedies and farces like *Ígnez Pereira*, 1523. He portrayed many national types and satirised the corruptions of Church and society. *Consult Life*, A. F. G. Bell, 1922.

Vicenza. City of Italy, capital of the Venetian prov. of Vicenza. It stands at the confluence of the Retrone and Bacchiglione, 41 m. by rly. W.N.W. of Venice. The old city, which has seven bridges across the rivers, is girdled by a moat and half-ruined walls. Many of its buildings were designed by Palladio, a native; the Basilica Palladiana surrounding the Palazzo della Ragione has a slender campanile 265 ft., the Rotonda Palladiana shows a Greek colonnade, the wooden Teatro Olimpico (1584) has curious permanent scenery on the stage. On Monte Berico, S. of the city, rises the pilgrimage church of Madonna del Monte. Silk and silk goods are the chief product; straw hats, woollens, leather, and musical instruments are also made. There is a trade in wine, wheat, and vegetables. Pop. (1936) 69,379.

Known to the Romans as Vicetia, the place in the early Middle Ages was the capital of a Lombard duchy. It joined the Lombard League against Barbarossa in the 12th century. Successively under the

control of the city of Padua and the families of Scala and Visconti, it became subject to Venice in 1404. In the Second Great War the cathedral was wrecked, six churches suffered damage, and a score of palaces were wholly or in part destroyed by fire as a result of Allied air attack on the Vicenza rail-yards in the spring of 1945.

Vice-President. American officer of state. He is elected every fourth year at the same time and in the same manner as the president, the two being voted for on a joint ticket. His only official duty is to preside over the senate, but without a vote except in case of a tie. By custom he often represents the president at social functions. His salary is \$15,000, together with various allowances. Although the normal duty of a vice-president is slight, occasions arise when it becomes of supreme importance. "In case," says the constitution, "of the removal of the president from office, or of his death, resignation, or inability to discharge the powers and duties of the said office, the same shall devolve on the vice-president." The following have stepped into the White House on the death of the president: Tyler (1841), Fillmore (1850), Johnson (1865), Arthur (1881), T. Roosevelt (1901), Coolidge (1923), H. S. Truman (1945).

Viceroy (Lat. *vice*, in place of; Fr. *roi*, king). Term used for one

who governs on behalf of a sovereign. The governor-general of British India was usually called the viceroy, as was the lord-lieutenant of Ireland until 1922. The last viceroy of India was Earl Mountbatten, appointed 1947. The Spanish king's representatives in Naples and America were officially styled viceroys. The feminine is vice-reine.

Vice Versa. Title of a humorous fantasy by F. Anstey (*q.v.*), published 1882. Paul Bultitude, a City man, is granted his heedless wish to be a schoolboy again, and for a time changes bodies, but not minds, with his son Dick. The father goes away to the son's private school while the son mismanages the father's business. A stage version, by Edward Rose, was produced at the Comedy Theatre, London, 1910, a film version (with Roger Livesey) 1948.

Vich or **VIQUE**. City of Spain, in the prov. of Barcelona. It is 38 m. by rly. N. of Barcelona, in a hill-encircled plain, with quaint houses which straggle up the slopes. The cathedral, built in 1040 and repaired 1803, has beautiful tracery to its cloister windows. The museum of art and archaeology has prehistoric, Greco-Roman, and medieval antiquities. Textiles occupy many inhabitants; hats and paper are manufactured. Known to the Romans as Ausa, Vich was later



Vicenza, Italy. 1. The Civic Museum, one of Palladio's finest buildings. 2. The church of S. Lorenzo. 3. The Piazza del Signore, showing, right, the Town Hall

called Ausona and Vicus Ausonensis. Pop. 14,600.

Vichy. Town and health resort of France, in the dept. of Allier. It stands on the right bank of the Allier, 232 m. by rly. S.S.E. of Paris and 75 m. W.N.W. of Lyons. Its agreeable climate and thermal springs have made Vichy one of the best-known watering-places in Europe. The *Établissement Thermale* is the property of the state, and there is a large export of the bottled waters. The Grande Grille, Puits Carré, and Célestins are the most important springs, alleged to be efficacious for digestive ailments, gout, liver troubles, and anaemia. The waters were known to the Romans, whose name for the town was Vicus Calidus. The seat of the Vichy government (v.i.) 1940-44, Vichy was liberated by French forces of the interior Aug. 26, 1944.

Vichy Government. Name usually given to the govt. set up by Marshal Pétain at Vichy after the Franco-German armistice in June, 1940. Its sphere was limited to unoccupied France, which area it continued in theory to rule even after the German occupation of the whole of France in Nov., 1942. It came to an end with Pétain's forcible removal from Vichy by the Germans on Aug. 20, 1944. Until the Allied invasion of French N. Africa in Nov., 1942, it commanded the allegiance of all the French colonies except French Equatorial Africa, the New Hebrides, and New Caledonia (which declared for de Gaulle in 1940) and Syria and Lebanon (occupied by the British and Free French, July, 1941). See France in the Second Great War; Laval; Pétain.

Vickers. Name of a British engineering firm. It was established in Sheffield in 1867 as Naylor Vickers and Co., and devoted itself to the fabrication of structural steels until 1897, when the Naval Construction and Armament Co. Ltd., and the Maxim-Nordenfeldt Guns and Ammunition Co. Ltd., were taken over. The name was then changed to Vickers' Sons and Maxim, one of the chief products of the new co. being the Vickers' machine-gun. In 1911 the firm assumed its present title of Vickers Ltd.

One of the earliest builders of aircraft, it introduced in 1913 the first aeroplane to carry a machine-gun. Throughout the First Great War the company produced a succession of notable military types, culminating in the Vimy bomber (see illus. p. 137) which in

1919 made the first air crossing of the N. Atlantic. In 1928 Vickers (Aviation) Ltd. was formed as a subsidiary co. to take over aviation activities, and soon absorbed the Supermarine aviation works, originators of the Spitfire (q.v.). In 1938 this subsidiary was taken over by Vickers Armstrong. Outstanding products of the Second Great War were the Wellington (q.v.) bomber and the Warwick. In 1946 the Viking air liner was introduced, and in 1950 the Viscount, the first turbo-jet air liner on regular service.

Vickers Hardness. Standard of measurement in metallurgy. The diamond pyramid hardness of the surface of a material may be tested by a Vickers hardness testing machine. This machine, with an adjustable force and for a set time, automatically presses the shaped diamond into the surface of the specimen under test. The diamond, a square pyramid of apex angle 136° held apex down against the material, leaves a square shaped recess in the surface. By measuring through a microscope the mean length of the diagonals of the square on the surface level, and relating this dimension to the applied load by a standard equation, a figure known as the diamond pyramid hardness results. The equation is $D.P.H. = 1.854 \times \text{load} \div \text{diagonal squared}$, with load in kilograms and diagonal in millimetres. The harder the material, the smaller the recess, and the greater the Vickers hardness number.

Vickerstown. This town of Lancashire, really a suburb of Barrow-in-Furness, is described under Walney Island.

Vicksburg. City of Mississippi, U.S.A., and the co. seat of Warren co. It stands at the confluence of the Yazoo and Mississippi rivers, 235 m. by rly. N.N.W. of New Orleans, and is served by the Alabama and Vicksburg and other rlys., also by river steamers and barges. It is an important centre of the cotton trade. Industrial plants include saw mills, lumber mills, iron and boiler works, canneries, and furniture and ice factories. Negroes form 51 p.c. of the pop. Disaster threatened Vicksburg in 1876, when the Mississippi suddenly cut a new channel, isolating the city; govt. engineers diverted the Yazoo into a canal, thus transforming Vicksburg again into a river port in 1902. Settled about 1811, Vicksburg was incorporated as a town in 1824, and became a city in 1836. Pop. 24,460.

Vicksburg, SIEGE OF. Operation in the American Civil War (q.v.). In Nov., 1862, Grant had begun a series of unsuccessful movements against the great fortress of Vicksburg. On April 30, 1863, having effected the passage of the Mississippi, he drove the confederates behind Vicksburg and besieged the latter more closely. On July 4 Pemberton, Confederate commander, surrendered with 30,000 men and nearly 200 guns.

Vicomte de Bragelonne, L. Romance written by Alexandre Dumas in collaboration with Auguste Maquet, 1848-50. It is a narrative of enormous length, and introduces the heroes of The Three Musketeers (q.v.).

Victor. Name of three popes and two anti-popes. Victor I, pope A.D. 189-198, ranks as the 14th bishop of Rome. A native of Africa, he decreed that Easter must always be kept on Sunday. He was canonised as a martyr, but his martyrdom is not recorded.

Victor II (c. 1018-57). Pope 1055-57. The son of Count Hartwig of Bavaria, and a kinsman of the emperor Henry III, his name was Gebhard. At 24 he was made bishop of Eichstätt, and on the death of Leo IX was nominated to the papacy by the emperor on the advice of Hildebrand. Gebhard made his election conditional on the emperor returning to the papacy all possessions taken from it. On Henry III's death, 1056, the guardianship of his son fell to the pope, who crowned him Henry IV. Victor died at Arezzo, July 28, 1057, and was buried at Ravenna.

Victor III (c. 1026-87). Pope in 1086-87. Born at Benevento, of a noble Lombard family, he became a Benedictine monk, and under the name of Desiderius was chosen abbot of Monte Cassino in 1057 and created cardinal in 1058. His influence as abbot was used to bring the Normans in Italy to the support of the papacy, and to mediate between Gergory VII and the emperor. Named by that pope on his deathbed, 1085, as his successor, Desiderius resisted, but a year later was forcibly declared pope. Driven from Rome by the emperor's prefect, he retired to Monte Cassino, and only on the expulsion of the anti-pope, Clement III, did he return to be consecrated. He died at Monte Cassino, Sept. 16, 1087, and was succeeded by Urban II.

Victor IV. Title of two anti-popes. (1) Cardinal Gregory Conti, who reigned in opposition to Innocent II in March-May, 1138.

(2) Cardinal Octavian, who belonged to the powerful Roman family of the counts of Tusculum, and reigned 1159-64. Elected by a minority of the cardinals, he had the support of the clergy and people of Rome against Alexander III. The emperor Frederick Barbarossa objected to Alexander, and convoked a synod which met at Pavia, 1160, and declared for Victor, anathematizing Alexander. The anti-pope died at Lucca, April 20, 1164.

Victor, CLAUDE PERRIN (1764-1841). French soldier. Born at La Marche, in the Vosges, Dec. 7, 1764, he entered the army in 1781, and in 1793 was made a general, his daring at the siege of Toulon having brought him under Napoleon's notice. In the Italian campaigns, 1796-1800, he increased his reputation, and as a reward for his services at Friedland in 1807 was made a marshal and then duke of Belluno. In command in Spain, he was beaten by Wellington at Talavera, but in the Russian campaign of 1812 he was prominent in the rearguard action at the Beresina. Resenting some criticism passed by Napoleon upon his conduct at Montereau-sur-Yonne, where he was wounded, Victor transferred his allegiance to the Bourbons. He was war minister 1821-23, and died in Paris, March 1, 1841.



Claude Victor,
French soldier

Victor Amadeus (1666-1732). Italian monarch. Born at Turin, May 14, 1666, he succeeded his father Charles Emmanuel II in the dukedom of Savoy at the age of nine. Marrying a niece of Louis XIV, he fell under that monarch's influence, and at his instigation



Victor Amadeus,
King of Sardinia

crushed the Waldensian Protestants in 1685. Victor broke away and fought against France, 1690-96, but allied himself with her periodically after that, until in 1704 he joined the Allies until the end of the Wars of the Spanish Succession. Granted the throne of Sicily at the peace of Utrecht, 1713, he exchanged it for that of Sardinia, Piedmont, and Savoy. In

1730 he abdicated, but seeking later in the same year to regain the throne, he was arrested by his son Charles Emmanuel, and died in confinement at Moncalieri, Oct. 31, 1732. The closing events of his life form the subject of Browning's play, *King Victor and King Charles*.

Victor Emmanuel I (1759-1824). King of Sardinia, 1802-21. Born at Turin, July 24, 1759, the second son of Victor Amadeus II, he came to the throne on the abdication of his brother Charles Emmanuel II, 1802, although the French occupied all his territory except Sardinia. He regained his kingdom, with the addition of Genoa, in 1815. In consequence of the popular demand for a constitution, which the great powers of Europe forbade him to grant, he abdicated in favour of his brother Charles Felix, March 13, 1821. Retiring to Nice, he died Jan. 10, 1824.



Victor Emmanuel I,
King of Sardinia

Victor Emmanuel II (1820-78). First king of united Italy, 1861-78. Son of Charles Albert, king of Piedmont-Sardinia, he was born at Turin, March 14, 1820. He commanded a brigade in the disastrous war against Austria 1848-49, and



Charles abdicated in his favour after the defeat of Novara, March 23, 1849, leaving Victor Emmanuel to make terms with Radetzky. Refusing to be intimidated by Austria, the young king maintained the constitution and liberty of his realms, wisely appointing Count Cavour his prime minister in 1852. He participated in the Crimean War, in which Sardinia was treated as an equal by the other western powers. An alliance with France in 1859 enabled him to wage war on Austria, and, despite the peace of Villafranca, to liberate Lombardy. The following year Tuscany, Modena, and Parma, which had thrown off their despotic yokes, united themselves to Piedmont, while Garibaldi's conquest of Sicily and Naples added the whole peninsula, save Rome and Venetia, to united Italy, of which Victor

Emmanuel was declared king, Feb. 26, 1861. The inclusion of Venetia, 1866, and Rome, 1870, completed his realm.

Victor Emmanuel, despite his bluff ways and crude simplicity, was a skilful diplomatist and a conscientious monarch. His treatment of the difficult crises brought about by the impetuosity of Garibaldi and the hopeless papal attitude of *non possumus* saved the country from many domestic troubles and foreign interference. Intensely popular, the *Re galantuomo* (gallant king), as he was universally called, was a brave but moderate soldier. He kept various mistresses and married one of themmorganatically in 1869. In other respects he was a devout churchman. At all events he was the point about which all parties of the state rallied, and his death, Jan. 9, 1878, was a national loss. A Life, by C. S. Forester, appeared in 1927. See Cavour; Garibaldi; Genoa.

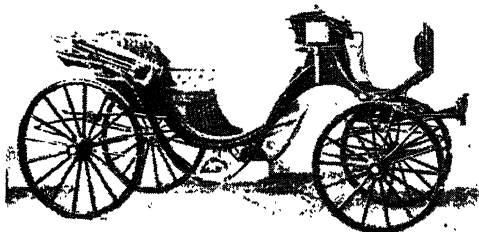
Victor Emmanuel III (1869-1947). King of Italy, 1900-46. Son of the prince of Piedmont (later Humbert I), he was born at Naples, Nov. 11, 1869, and entered the army in youth. In 1896 he married Princess Helena of Montenegro, and he ascended the throne on the assassination of his father, July 29, 1900. For some years he gave up the management of state affairs to his prime minister Giolitti, and gained the affections of the people, being esteemed a man of wide culture, with special knowledge of coins. He lost popularity in the First Great War. His relations with Mussolini (*q.v.*) were at first distant, but he soon allowed himself to become the figurehead and spokesman of the fascist regime. Its symbols were added to the royal arms in 1929. The king was proclaimed emperor of Abyssinia in 1936, and king of Albania, 1939. Although he welcomed Hitler to Rome, he opposed Italy's entry into the Second Great War, but failed to take any independent action until in 1943 the grand council forced Mussolini's resignation. After the Italian armistice with the Allies Victor Emmanuel's continuance on the throne was a source of contention among the Italian political parties. He agreed to retire from public life when



Victor Emmanuel III,
King of Italy

Rome was liberated from the Germans, and on June 4, 1944, handed over his powers to his son, the prince of Piedmont (Humbert II), abdicating May 9, 1946. He died at Alexandria, Dec. 28, 1947.

Victoria. Four-wheeled carriage, having a low seat for two, a raised seat in front for the driver,



Victoria. Two-horsed carriage introduced into England from the Continent in 1869

and a calash top. It is named after the British queen, in whose reign it was introduced and enjoyed great popularity. See Carriage.

Victoria. British battleship. Launched in 1887, she carried two 16-25-in. and one 10-in. guns on a displacement of 10,470 tons. She was rammed and sunk during manoeuvres in the Mediterranean by the battleship Camperdown on June 22, 1893, with a loss of 321 officers and men. The fleet was steaming in two parallel columns, Victoria and Camperdown leading, and the catastrophe arose through the admiral, Sir George Tryon (*q.v.*), who was in the Victoria, trying to turn the columns inwards in an insufficient space. Tryon went down with his ship.

Victoria. River of Australia, largest in the Northern Territory. It flows into Queen's Channel near the border of W. Australia. It drains an area of 90,000 sq. m., most of which, such as the Victoria River Downs, is splendid grass country in the occupation of pastoralists. Large vessels can navigate the lowest 50 m.

Victoria. State of the Australian commonwealth. It lies in the S.E. corner of the continent. It has an area of 87,884 sq. m., and a pop. (1947) of 2,055,252, of whom 1,226,923 live in greater Melbourne.



Victoria arm

Victoria has a warm temperate climate, characterised by a low rainfall; in the N.W. the Murray basin has less than 20 ins. annually; at the coast it varies between 25 and 40 ins. In the

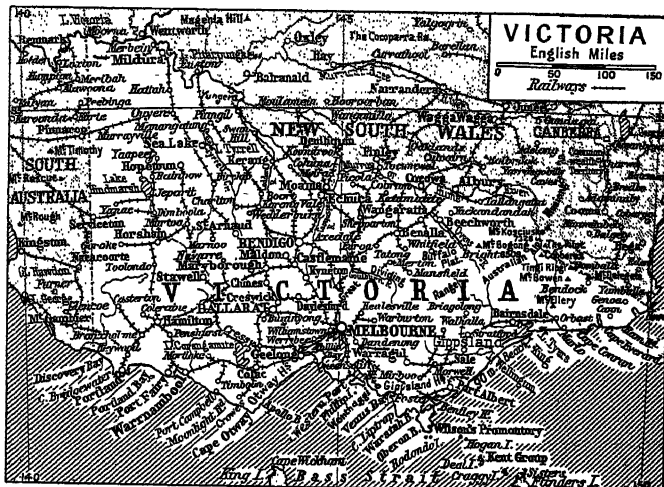
Australian Alps rainfall exceeds 50 ins. in the most elevated sections; there also snow lies in the winter, and skating and other winter sports attract tourists, particularly to the Buffalo national park above the Ovens valley. Throughout the state, but more especially in the W., the greater quantity of rain falls during the winter, June-Aug., which gives Victoria a climate allied to that of the Mediterranean lands. The mean temp. of Melbourne varies between 67° F. in Jan. and 49° F. in July; its yearly rainfall is 25 ins.

An unpleasant feature of the climate of Victoria is the northerly summer winds, called "brickfielders," which carry heat and choking clouds of dust from the interior (like the sirocco of

Port Phillip is a submerged portion, and at the end of which are the Gippsland hills and lakes; the central highlands; and the S. side of the valley of the Murray.

Through the state, E. and W., run the southernmost parts of the Great Dividing range, called in the W. the Grampians and in the E. the Australian Alps, among which lie the highest peaks in the state, rising to more than 6,000 ft. These mts., of great scenic beauty, include the Buffalo plateau and national park.

The rivers form two main systems, those which flow into the sea, of which the Yarra is the most important, and those which flow into the Murray, of which the Ovens, the Goulburn, the Campaspe, and the Loddon are the longest. Victoria has made good use of its water resources: about one quarter of the total area is supplied artificially. The Goulburn system irrigates 1,300,000 acres, the Murray system 500,000 acres. Irrigation has made fruit growing



Victoria. Map of the southern state of the Australian Commonwealth, famous for the extent of its sheep runs and wheat farms

the Mediterranean). These hot, sultry spells, when daily temps. may rise well above 100° F., are suddenly followed by the violent "southerly bursters" which, by contrast, appear very cold.

Victoria is bounded on the N. and N.E. by New South Wales, from which it is separated by the River Murray; on the W. by South Australia, and on the S. and S.E. by the Southern Ocean, the Bass Strait, and the Pacific Ocean. Its greatest length from E. to W. is 490 m., its greatest depth from N. to S. 280 m. It comprises three areas, the great valley, of which

possible and has thus contributed greatly to the prosperity of the state, in which the chief occupations are agricultural and pastoral, in particular wheat growing, sheep-rearing, dairying, poultry farming, and fruit growing.

Wheat is the principal crop, with a yield varying from 3,498,000 bushels from 2,142,000 acres (1944-45) to 46,954,000 bushels from 2,757,000 (1941-42) according to the kindness of the climate. Other important crops are oats, barley, potatoes, hay, and the vine, nearly 2 million galls. of wine being made in 1945-46. Production of

raisins and currants, apples and other orchard fruits is important.

Livestock in 1946 numbered: sheep 14,655,277, cattle 1,827,087, pigs 271,887, horses 232,473; but numbers vary considerably from year to year. Wool production in 1944-45 was just over 177 million lb. valued at nearly £12 million; in 1945-46, 152 million lb. worth £9½ million; 51,600 tons of butter were produced in 1945-46; some 7,000,000 sheep and lambs are slaughtered annually for meat.

Victoria has produced much gold since 1853, in which year Ballarat became the centre of a great gold rush. After this had subsided gold mining was developed on a scientific basis and output steadily increased. Many of the mines were, however, closed during the Second Great War; 86,993 fine oz., worth £936,268, were produced in 1946. There are some black coal, and vast brown coal, deposits. Other minerals found are limestone, kaolin, and gypsum.

Industry, especially that connected with fruit preserving and the production of agricultural machinery, has greatly increased since the beginning of the 20th cent. There is also a considerable manufacture of vehicles, clothing, food, drink, and tobacco.

About a quarter of the state area is forest, timber produced including hard and soft woods, suitable for building, cabinetmaking, and other industrial purposes. The forests also prevent soil erosion.

White knowledge of Victoria begins with Capt. Cook's sighting of Cape Everard in 1770. In 1798 surgeon George Bass sailed through the strait named after him, and unsuccessful attempts at settlement on the newly discovered coast of what is now Victoria were made during the following years, the first permanent settlers being the

Henty brothers who arrived in 1834. A year later Batman traded trinkets with aborigines, who had no ownership in the land, for 600,000 acres across the Yarra and the Plenty Rivers—a bargain not ratified by the N.S.W. govt., of which the newly settled area, then called the Port Phillip dist., formed a part. In 1835 also John Pascoe Fawkner founded Melbourne. In 1851 the dist. was proclaimed a separate colony named Victoria, and given a partly elected legislative council. It received full responsible govt. four years later. In 1901 it was one of the colonies, renamed states, formed into the commonwealth of Australia.

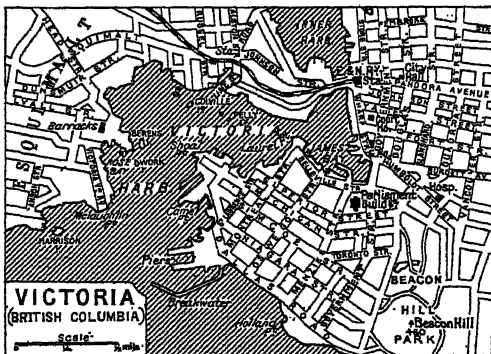
CONSTITUTION. The parliament of Victoria consists of a legislative council of 34, and a legislative assembly of 65. There is a property qualification for members of and electors to the council, but not the assembly. Women have equal voting rights. Executive power is in the hands of a governor who is advised by a cabinet. Victoria sends ten senators to Canberra, and a number of representatives to the lower house of 74 proportionate to her pop.—in 1950, 30. The state owns 4,784 m. of rly. built to develop agriculture and industry.

Primary education is free, secular, and compulsory. There are state secondary and intermediate schools, technical and domestic science schools, and a university at Melbourne, and schools run by R.C. and various Protestant communities. See Australia; consult also Victorian

Year Book (annually); Geography of Victoria, J. W. Gregory, 1907; Centenary History of Victoria, J. Pratt, 1934.

Victoria. One of the largest islands of Canada. This Arctic territory is 420 m. by 320 m., and is separated from the mainland by Dease Strait, Coronation Gulf, and Dolphin and Union Strait. It lies S.E. of Banks Island, S. of Melville Sound, and W. of McClintock Channel and Victoria Strait, and comprises Prince Albert Land and Wollaston Land. The W. coast is mountainous and deeply indented.

Victoria. Canadian city and port, cap. of British Columbia. It stands at the S.E. end of Vancouver Island, overlooking the Strait of San Juan de Fuca. As a port it has steamship connexions with Vancouver on the mainland, San Francisco, and places in Mexico and Alaska, and is also a port of call for steamers going from Vancouver to Australia, China, and Japan. It has the second largest dry dock in N. America. Shipping apart, industries include the making of furniture, boots, clothing, bricks, soap, chemicals, etc., as well as shipbuilding, lumbering, and canning. It is on the Esquimalt and Nanaimo rly., a branch



of the C.P.R., and also on a branch of the C.N.R. Owing to its equable climate, the city is a great tourist resort. The naval station of Esquimalt with its fine harbour is about 3 m. away. Victoria originated as Fort Victoria, a post of the Hudson's Bay co., and became a city in 1862. An Anglican cathedral was opened 1929. Pop. 87,400.

VICTORIA OR PORT VICTORIA. Capital of the Seychelles. Situated on the N.E. coast of the island of Mahé, the town has an excellent harbour, and serves as a naval coaling station. It is a picturesque place, since many of the houses, built of massive coral, shine in the sunlight like marble. The principal



Victoria, British Columbia. Air view of the inner harbour, containing one of the world's largest dry docks. Top, map of the harbour and adjacent districts

exports are rum, cocoa, and bêche-de-mer. It is connected by submarine cable with Zanzibar, Aden, and Mauritius.

Victoria. Settlement in Cameroons. On Ambas Bay, it was founded by the Baptist missionary society, and annexed by Great Britain in 1884, but given to Germany. It became British again 1919, on the division of Kamerun between the U.K. and France.

Victoria. Central city of the crown colony of Hong Kong on the is. of Hong Kong (*q.v.*).

Victoria (1819–1901). Queen of Great Britain and Ireland, 1837–1901, and empress of India, 1876–1901. She was born at Kensington Palace, May 24, 1819, and was baptized as Alexandrina Victoria. She was the only child of Edward, duke of Kent, the fourth son of George III, her mother being Mary Louise Victoria of Saxe-Coburg-Gotha, sister of its duke and also of Leopold I, king of the Belgians, who directed his niece's education, her father dying in 1820.

Victoria became heir presumptive in 1830, and ascended the throne, June 20, 1837, in succession to her uncle, William IV. The elder sons of George III—George IV, the duke of York, and William IV—left no surviving children, and the accession of Victoria happily prevented that of the fifth brother, Ernest, duke of Cumberland. The crowns of England and Hanover were thus separated, the Hanoverian succession lying only in the male line.

In 1840 the queen was married to her cousin, Albert of Saxe-Coburg-Gotha (*q.v.*), younger son of the duke. The eldest child, the Princess Royal, was married to the German Crown prince and became the mother of the emperor, William II. The second, Albert Edward, Prince of Wales, succeeded Victoria on the throne as Edward VII. The other children of the marriage were the Princess Alice, who became grand-duchess of Hesse-Darmstadt; Alfred, duke of Edinburgh, to whom the duchy of Saxe-Coburg-Gotha ultimately reverted; Helena, who married Prince Christian of Schleswig-Holstein; Louise, who became duchess of Argyll; Arthur, duke of Connaught; Leopold, duke of Albany; and Princess Beatrice, who married Prince Henry of Battenberg. The death of the Prince Consort in 1861 caused the queen's retirement from the public eye, though not from the discharge of her constitutional duties, throughout the remaining 40 years of her reign.



Queen Victoria. A portrait taken in the year of her diamond jubilee
Downey

At the outset of her reign she was under the experienced political tuition of Lord Melbourne, who was prime minister at the time, and from whom she learnt those sound principles of constitutional government which she practised so wisely and established so thoroughly during her long rule. Melbourne's personal guidance survived his retirement from office, and his place was subsequently taken by the Prince Consort; when he died, Victoria's long experience left her in no further need of any such support.

Queen Victoria's long reign covered an extraordinarily eventful period, but personally she had little to do with the change which developed during her reign in the status of the colonies and their relations with the mother country. She had a more direct claim to something of a personal share in the development of the idea of the imperial relations between the British and the natives of India.

The great Mutiny of 1857 led to the assumption by the crown of direct responsibility for the great dependency, and the very definite way in which she ranged herself on the side of Lord Canning, and her attitude of generous sympathy towards the Indian peoples, were of material aid in creating that spirit of loyalty which in 1914 bore such fruit as few had ventured to anticipate. Something of this was due also to her appreciation of that stroke of Oriental imagination by which Disraeli procured the queen's assumption from Jan. 1, 1877, of the new title empress of India.

Still more direct was the influence of Victoria's own personality upon the relations between the crown, ministers, and the British people. The political supremacy of parliament was indeed already a long established fact when she came to the throne. George III had, no doubt, attempted with temporary success to recover an effective supremacy for the crown

itself; but even for him the only method open had been that of organizing in parliament itself a dominant court party subservient to the royal will. That attempt had finally broken down, and neither of the sons who succeeded him renewed it.

There was no struggle between crown and parliament. The constitutional practice, established under the rulership of a single monarch exercised continuously for 64 years virtually withdrew from the crown the power of veto, which had prevented Catholic Emancipation in 1801, and even the power of dismissing a ministry without a preliminary appeal to the country, which had actually been exercised by William IV. But while there was some curtailment of actual power, the queen proved herself perfectly capable of resisting anything tending to a diminution of the crown's dignity or its indirect authority. When she was only twenty, her refusal in 1839 to give way to Peel (*q.v.*) on the Bedchamber question (*q.v.*) brought back the Melbourne ministry to office. In 1851, Palmerston (*q.v.*) was dismissed from the foreign office because he ignored the crown's claim to consultation. Several public men obnoxious to her were excluded from office. She insisted on her right to be thoroughly informed of current events, and to impress her views on ministers.

Prestige of the Crown

The crown also benefited in actual prestige, in the respect popularly accorded to it, from the high standard of personal conduct set by the queen and the prince consort, which offered a most favourable contrast to the contempt which had been brought upon it by George IV. In brief, when Victoria came to the throne the monarchy was not loved; at best it was most commonly regarded as a necessary bulwark against Jacobinism; but when she died, the constitutional monarchy was probably more secure of popular support than at any previous moment in its history.

The Osborne estate in the Isle of Wight was bought in 1845, and that of Balmoral in 1852, and in the houses built in these places a great deal of the queen's life was spent. After the death of the prince consort, she never stayed for more than a few days at a time in London. On June 20, 1887, the fiftieth anniversary of her accession, Victoria's jubilee was celebrated with great splendour by a thanksgiving service in Westminster Abbey. Ten years

later, a second festival, popularly known as the diamond jubilee, celebrated the longest reign of any British sovereign. At both jubilees great spontaneous demonstrations of loyalty took place. Victoria died at Osborne, Jan. 22, 1901, and was buried at Frogmore.

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Victoria and Albert. British order. Conferred on ladies only, it was instituted in 1862. It was remodelled in 1864, 1865, and 1880, but no conferments were made after the death of Queen Victoria. It is in four classes, the badge of the first three being a medallion of diamonds and pearls with portraits of the queen and Prince Albert; for the fourth class it is the royal cipher interlaced. The



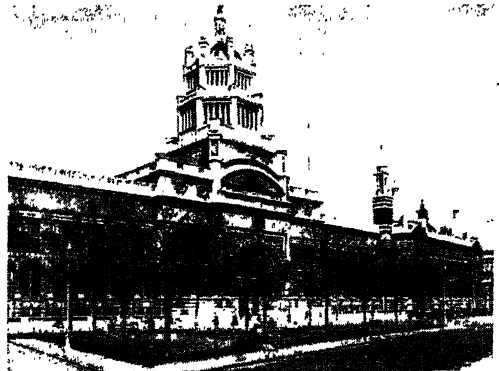
Victoria and Albert. Badge of the order

ribbon is of white moiré, and the members use the letters V.A.

Victoria and Albert and George V Docks, THE ROYAL. Part of the dock system of the port of London. They are situated in the vicinity of Canning Town, Silvertown, and North Woolwich, and cover an area of about 1,100 acres, over 240 acres water. The Victoria dock was opened in 1855, the Albert in 1880, the King George V dock (68 acres), at North Woolwich, in 1921. Frozen meat,

grain, fruit, and tobacco are the chief imports, cold storage accommodation being provided for over 13,000 tons of refrigerated meat, while the tobacco warehouses will hold some 40,000 tons. During the Second Great War considerable damage was done to sheds and warehouses, but, save for the destruction of part of the bascule bridge of King George V docks, the deep-water equipment escaped.

Victoria and Albert Museum. A London museum of fine and applied art, under the control of



Victoria and Albert Museum, London. The buildings which house the national collections of fine and applied art

the ministry of Education. Its nucleus was the Museum of Ornamental Art, established at Marlborough House in 1852. Five years later it was transferred to temporary buildings at South Kensington, becoming part of the collective S. Kensington Museum. During 1860-84 permanent buildings were constructed, and these being found inadequate, new buildings, designed by Sir Aston Webb, were completed in 1909, the year when the Victoria and Albert became an exclusively art museum. It contains one of the finest collections of decorative and ornamental art in the world, and houses some specialised collections, such as the national collection of water-colours. The Indian section, in Imperial Institute Road, and Bethnal Green Museum (1872) are branches.

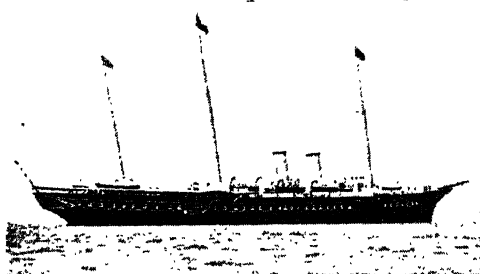
Victoria and Albert Yacht. Name of three former British royal yachts. The first was built at Pembroke in 1843 and was used by Queen Victoria for an annual cruise round the British Isles. In 1855 it was replaced by a second, which in 1863 brought Princess Alexandra of Denmark to England for her marriage to the prince of Wales, afterwards Edward VII.

In 1899 the third Victoria and Albert was launched at Pembroke.

Displacing 4,700 tons she had engines developing 11,000 h.p. to give a speed of 20 knots. During

and red for the army. When worn without the cross, the ribbon carries a small replica of the decoration on its centre.

Awarded for "conspicuous bravery or devotion to the country in the presence of the enemy," the honour was originally confined to white officers and men. In 1911 the right to receive it was extended to native troops, and in 1920 to matrons, sisters, and nurses, those of ancillary medical services, and civilians of either sex regularly or temporarily under the orders of naval, military, or air forces of the British Empire.



Victoria and Albert Yacht. The third British royal yacht to bear the name Victoria and Albert, moored in Portsmouth Harbour

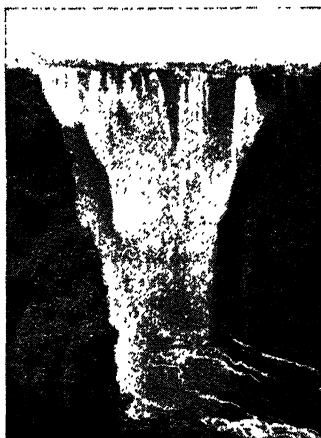
both Great Wars she was an accommodation ship at Portsmouth, and, condemned as being unseaworthy in 1946, was converted into living quarters for the royal family when visiting the port. In 1939 plans had been approved for a new yacht, but construction was postponed. The Victoria and Albert was kept permanently in commission; her company of 365 officers and men was the largest yacht crew in the world. Her commander, a vice-admiral, performed the functions of both admiral and captain, as she was the only ship under his command. Uniform for ratings consisted of the old-fashioned cloth trousers worn over the jumper, and all cap and sleeve badges were in white instead of red or gold. Lower deck personnel were rated as riggers instead of able seamen.

Victoria Cross. British decoration for gallantry, the highest of its kind. Instituted by Queen



Victoria Cross, awarded for valor

inscription "For Valour." From its institution the Cross was by Victoria's decree struck from the metal of guns captured at Sevastopol until, that source of metal having been exhausted, it was from 1942 struck from metal supplied by the royal mint. The cross is suspended from a crimson ribbon by a laurel bar and V-shaped link; until 1918 the ribbon was blue for the navy



Service holders of the V.C. below commissioned rank receive an annuity of £10, plus an addition of 6d. daily to the service pension. If a holder is unable to obtain a livelihood on leaving the service, the annuity may be increased to £75. For a posthumous award £50 is credited to the recipient's estate.

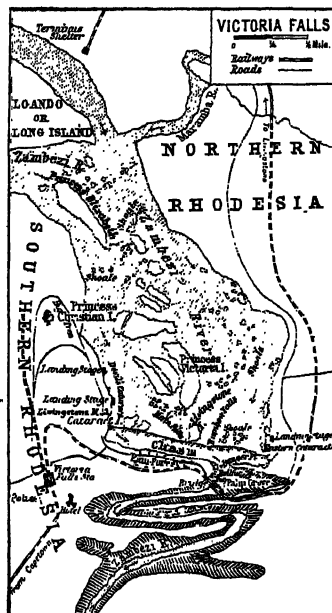
Altogether 1,310 V.C.s had been awarded to the end of the Second Great War, of which 525 were won before the First Great War. In that war 623 were given, 163 posthumously: the navy won 45, army 410, and R.A.F. 15; Australia 62, Canada 61, New Zealand 11, India 15, S. Africa 4. Second Great War awards totalled 162, of which 73 were posthumous: the army gained 58, navy 20, R.A.F. 19; India 29, Australia 15, New Zealand 8, Canada 8, S. Africa 4, Fiji 1.

In 1948 there were living 509 holders of the V.C., the oldest

recipient being Pte. T. Edwards, who won it in 1884 while serving with the Black Watch in the Sudan. Lt.-Col. A. Martin-Leake won the V.C. with the S. African police in the Boer War, and again with the R.A.M.C. in the First Great War; Capt. C. H. Upham, N.Z. army, won it in Crete, 1941, and again in the Western desert, 1942. Holders of a double V.C. wear a bronze bar on the ribbon. Danish Major Lassen was awarded the V.C. while serving with a British commando unit in Italy, 1945. See Medals colour plate.

Victoria Embankment. Part of the Thames embankment, London. It extends on the left bank between Westminster and Blackfriars bridges and was constructed in 1864-70. Here the double tramway tracks are segregated from the main traffic road. See Thames Embankment.

Victoria Falls. Falls on the Zambezi river in S. Rhodesia. Situated 7 m. S. of Livingstone, they were discovered by Livingstone in 1855, and are about 357 ft. deep and about one mile long. The Zambezi drops into a chasm running from E. to W., and the falls consist of different cascades broken by islands and rocks. The Zambezi is crossed, 400 yards below the falls, by a single span girder rly. bridge, 400 ft. above water level, on the main rly. N. from Cape

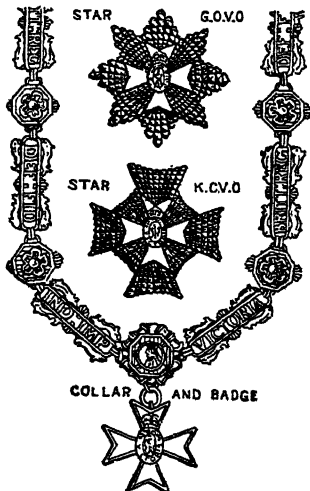


Victoria Falls. Map showing the configuration of the Zambezi river above and below the falls. Top left, a view of the falls

Town to the Congo, finished in 1905. The volume of water varies between 60,000,000 and 100,000,000 gals. per min.; in 1936 the quantity fell to under 4,000,000 gals., and the E. cataract dried up. A hydro-electric station, developing 2,000 kW., was started here in 1938.

Victoria Memorial. The national memorial to Queen Victoria included an elaborate monument, new E. façade to Buckingham Palace, widening of The Mall, and Admiralty Arch was designed by Sir Aston Webb, with sculptures by Sir Thomas Brock, (*q.v.*), and cost over £300,000. The memorial proper occupies a garden space in front of the palace, took nine years to construct, and was unveiled May 16, 1911, by George V in the presence of the German emperor, William II. Mainly of white marble, it includes a pedestal surmounted by a gilded bronze Victory, with a seated figure of the queen at the base, surrounded by much elaborate ornamentation.

Victorian Order, ROYAL. British order of knighthood originally awarded to British and foreigners who had rendered service to Queen Victoria. The order dates from 1896. There are six grades, knight or dame grand cross (G.C.V.O.), knight commander (K.C.V.O.), dame commander (D.C.V.O.), commander (C.V.O.), and two classes of members (M.V.O.). The badge is a white Maltese cross with a crimson oval centre bearing the royal and imperial cipher, surrounded by a blue circle, in which is inscribed in gold Victoria, and surmounted by the



Victorian Order. Insignia of the British order of knighthood



Victoria Memorial, London. The national memorial to Queen Victoria in front of Buckingham Palace. It was unveiled by King George V in 1911

imperial crown. The ribbon is dark blue with a narrow edge of red, white and red. The chancellor of the order is the lord chamberlain. See Knighthood.

Victoria Nyanza OR LAKE VICTORIA. One of the four great freshwater lakes in Central Africa. From it issues the Nile. Known to the Arabs as Ukerewe, it was first discovered from the S. in 1858 by Speke. It is situated at an alt. of 3,726 ft., has an area of about 27,000 sq. m., and is 255 m. long by 155 m. wide. On the N. and N.W. is the Uganda protectorate, on the E. is Kenya Colony, and on the S.W., S., and S.E. is Tanganyika Territory.

The principal feeders of the lake are the Katonga, Bukora, and Kagera, entering the lake N. of Bukoba, and the Simiyu, Mbalageti, Ruwana, and Mara rivers on the S.E. side. There are a number of large gulfs, of which the Kavirondo Gulf (N.E.), the Speke Gulf (S.E.), and Emin Pasha Gulf (S.W.) are the chief. The Nile leaves the lake on the N. at Jinja, near which place are the Owen Falls. In addition to Kisumu and Jinja, the more valuable ports are Port Bell which serves Kampala, the native capital of Uganda, Entebbe, Bukoba, the chief entrance to the Ruanda country, Mwanza, at the S. end of the lake, and Shirati, on the E. side. From Jinja, the Busoga railway runs northwards to Namagali. The lake varies seasonally in height by about 43 ins., according

to the amount of rainfall in the catchment area. The Owen Falls Dam (*q.v.*), begun in 1949 as part of a hydro-electric scheme, to benefit both Uganda and Egypt, has raised the former level of the lake by some four feet and made it the world's largest reservoir

Victoria Park. London public recreation ground of 217 acres, N.E. of Bethnal Green, laid out 1842-45, and enlarged 1872.



Victoria Regia. Floating leaves of the giant S. American water lily in a hothouse at Kew Gardens, London

Victoria Regia. Giant aquatic herb of the family Nymphaeaceae. Also called royal water lily and water maize, it is a native of the Amazon, Guiana, and La Plata. It grows only in still, shallow (4 to 6 ft. deep) waters, and has a thick perennial rootstock. The floating leaves are round, measuring from 4 to 12 ft. across, with the edges turned up for several inches. The flower is 15 to 18 ins. across, and lies on the surface of the water. The top-shaped calyx has purple-brown segments, and the numerous petals are in several series, the outer ones white and much broader than the purple or rose-coloured inner ones, surrounding the fleshy awl-shaped stamens and the large ovary with

its cup-shaped depression. This develops into a large green, prickly berry, containing numerous dark brown oval seeds, which are roasted and eaten by the people of Guiana.

Victoria Station. Main line London rly. terminus, near to Buckingham Palace Road. Opened in 1860, its purpose was to provide a West End terminus for the London, Brighton, and South Coast, and the London, Chatham, and Dover rlys. Construction was undertaken by the Victoria Station and Pimlico rly. co. A year after opening, the Chatham and Dover portion was jointly leased to that co. and the G.W.R.; the latter, laying broad-gauge tracks, used it as a southern suburban terminus. The Brighton half of the terminus was also used by the London and N.W. rly. under a toll arrangement. In 1923 the whole was absorbed by the Southern rly. which opened the wall dividing the two stations.

Victoria station has 17 platforms, and handles an average of 1,052 trains every 24 hrs. The Brighton section carries a heavy electrified traffic, while the Chatham section is the starting point for Continental services, including the Golden Arrow. In the forecourt is a large omnibus terminus.

During the First Great War, No. 2 platform acquired a tragic significance as that from which the army leave trains left for France. For a short time in 1944-45 leave trains to and from the B.L.A. in France also used Victoria. On Sept. 15, 1940, a Dornier bomber shot down in the great daylight raid of that day crashed on an island of shops on the N. forecourt. Victoria gives its name loosely to a dist. and to a telephone exchange.

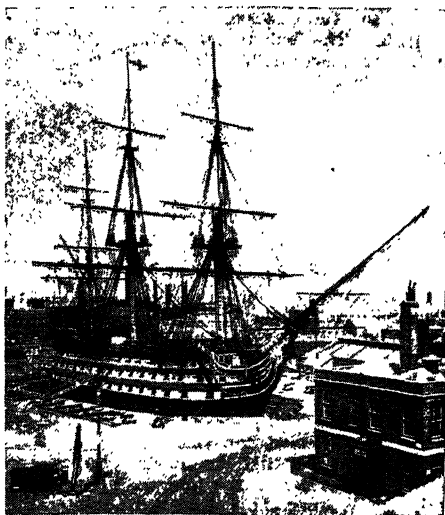
Adjacent to Victoria rly. station is the London terminus of B.O.A.C. etc. Near by are a Green Line and London Transport garage, and a coach station served by extra-London lines.

Victoria University. Name of an English university that existed from 1880 to 1903. It consisted of Owens College, Manchester; University College, Liverpool; and University College, Leeds. In 1903 it was dissolved, and soon afterwards the three became separate universities. The prefix Victoria is still retained by Manchester university (*q.v.*).

Victoriaville, Town of Quebec, Canada. It is situated on the Nicolet River, 40 m. S. of Three Rivers, and is on the C.N.R. Its industries include furniture and clothing factories, planing mills, and machine shops. Pop. 8,516.

Victory. British ship of the line. She was designed by Sir Thomas Slade, and launched at Chatham dockyard, May 7, 1765, but not commissioned until 1778. She was 226 ft. 6 ins. long from figure-head to taffrail, 186 ft. on the gun-deck, and 52 ft. in beam, the tonnage being 2,162; and her armament on first commissioning was 12 short and 32 long 12-pdrs., 30 24-pdrs., and 30 32-pdrs. Nelson selected her as his flagship when appointed commander-in-chief in the Mediterranean, 1803, and in that capacity, and in the same ship, he won the battle of Trafalgar. She was paid off from active service in 1812, and was afloat in Portsmouth Harbour until 1922, when the condition of her hull was found so bad that it was decided to place her permanently in dry dock. Since then she has been completely restored; hull and rigging are exactly as they were at Trafalgar. Since 1825 the Victory has been the flagship of the c.-in.-c. at Portsmouth. In the Second Great War she was an accommodation ship for gunners on A.A. defences.

Victory Medal. Allied medal of the First Great War. It was awarded to all officers and men in the Allied armies who entered a theatre of war on the strength of any military unit, and in the navies to all officers and men who had been afloat on duty, Jan., 1914 - Nov., 1918. It was also given to



H.M.S. Victory. The old flagship of Keppel, Jervis, and Nelson, permanently in dry dock at Portsmouth

airmen, dominion, colonial, and Indian forces, and to women's formations. Its scope was extended in 1920 to include military operations in N. Russia and Siberia, and in the Caucasus.

The medal is of bronze. On the obverse is a winged figure of Victory. On the reverse is the inscription, The Great War for Civilization, translated into the different languages. The ribbon is identical for all countries. In 1920 an oak leaf in bronze was authorised to be worn on the ribbon by any who were mentioned in dispatches. See Medal colour plate.

Victualling Yard. Admiralty depot from which vessels of the British navy can be supplied with stores of various kind, including food supplies.

Vicuña (*Arachemia vicuña*). A small species of wild llama. Found in Peru and neighbouring countries, it belongs to the camel family, but is of smaller size and more graceful form than the true camels. Its hair is light brown, with paler markings on the face. During the hot weather it is found in the valleys, but in the rainy season it frequents the higher ranges of the hills. It occurs in small flocks, each male consorting with several females. From its wool a soft clothing fabric is made.

Vicuña. Town of Chile in the prov. of Coquimbo. It is situated 50 m. W. of Coquimbo, on the rly. to Rivadavia. The neighbouring mines, orchards, and vineyards have most picturesque settings. There is an important industry in dried and crystallised fruits. Ther-



Vicuña. Small wild llama of Peru W. S. Berridge. F.Z.S.

mal springs occur in the neighbourhood. Pop. est. 10,000.

Vicuña Mackenna, BENJAMIN (1831-86). Chilean historian and politician. He was born Aug. 25, 1831, in Santiago, and died near Valparaíso on his 55th birthday. Educated at Santiago, he took part in the revolution of 1851, and in 1856 was made a member of congress. Vicuña wrote lives of Diego Portales, 1863; Bernardo O'Higgins, 1882; Juan Fernandez, 1883.

Vic-Wells Ballet. British organization set up as a permanent ballet repertory company after the reopening of Sadler's Wells theatre (in conjunction with the Old Vic) in 1931. Under Ninette de Valois, director of the ballet from its foundation, and Constant Lambert, musical director 1932-47, the company, with its own school for training dancers, was raised to international standards. From 1946 the Sadler's Wells ballet (as it was later called) gave regular seasons at Covent Garden, a second company performing at Sadler's Wells theatre. Their first tour of the U.S.A. and Canada, Oct.-Dec., 1949, was an outstanding success.

Vidin. Town of Bulgaria, capital of a dept. of the same name. It stands on the right bank of the Danube, in a marshy dist. 95 m. by rly. N.N.W. of Sofia. A ferry links it with Calafat across the river in Rumania. On the site of the Roman Bononia, it is a fortified river port. Its principal trade is in wine, and here is a school of viticulture. It makes gold and silver filigree of local renown. Pop. 18,465.

Vidocq, EUGÈNE FRANÇOIS (1775-1857). French detective. He was born at Arras and in 1809,



Eugène Vidocq,
French detective

after serving terms of imprisonment for theft, forgery, and highway robbery, offered his services to the police, at whose instigation he served a term in prison, and was allowed to mix freely with the inmates, thus gaining their confidences and betraying them to the police. So successful was the police spy that in 1817 he was authorised to establish a regular body of detectives. He retired in 1827, tried to regain his old post in 1832, but failed, and died in poverty. *Consult* Life, E. A. B. Hodgetts, 1929.

Vidor, KING WALLIS (b. 1895). American film director. Born at Galveston, Feb. 8, 1895, he was educated at the high school there and at Peacock military academy. He attained fame with *The Big Parade*, 1927, a silent film about the First Great War. *The Crowd*, and *Hallelujah* were spectacular pictures involving hundreds of performers. Vidor directed *Stella Dallas*, 1937; *The Citadel*, 1938; *North-West Passage*, 1940; *On Our Merry Way*, 1948.

Vidovdan Constitution. First constitution of Yugoslavia. It was put into effect in 1921, and, although highly centralised, contained provisions for some local govt. and for a democratically elected parliament. In 1929 it was abrogated by King Alexander, who substituted for it what was in effect a personal dictatorship.

VIENNA: CAPITAL OF AUSTRIA

Simon Wolf, LL.D., (Vienna)

The famous city which has been the capital of two great empires, successfully resisted two sieges by the Turks, and created a life of cosmopolitan charm and gaiety entirely its own is here described in all its aspects

Contrary to popular belief, Vienna (Ger. Wien) does not lie on the banks of the Danube: the term *Donaustadt* (Danube city) is misleading, for Vienna's oldest districts are several miles from the main river, and newer parts are farther still. The city has ex-



Vienna arms

tended to the N., S., and particularly to the W., but only very little to the E., where the Danube flows. A branch of the river, however, the so-called Danube Canal, flows through Vienna, separating the inner and western dists. from three districts in the E. Its bridges were blown up by the Germans in the Second Great War.

Vienna is divided into twenty-one numbered districts. Of these, I, Innere Stadt; II, Leopoldstadt; III, Landstrasse; IV, Wieden; VI, Mariahilf; VII, Neubau; IX, Alsergrund, are shown in the map. The others are V, Margareten; VIII, Josefstadt; X, Favoriten; XI, Simmering; XII, Meidling; XIII, Hietzing; XIV, Rudolfsheim; XV, Fünfhaus; XVI, Ottakring; XVII, Hernals; XVIII, Währing; XIX, Döbling; XX, Brigittenau; and XXI, Floridsdorf. The Innere Stadt is the old, historic city of Vienna, round which there

Viedma. Town of Argentina. It is the capital of the territory of Río Negro, stands on the river Viedma, and is 577 m. S.W. of Buenos Aires by rly. A rly. and road bridge spans the river between Viedma and Patagones. This is the only direct rly. connexion between N. and S. Argentina. Pop. 9,000.

Vieira, ANTONIO (1608-97). Portuguese ecclesiastic. Born in Lisbon, Feb. 6, 1608, he became a Jesuit, and was ordained 1635. In 1640 he became chaplain to John IV, and served on diplomatic missions. In Brazil, 1653-61, he applied himself zealously to the conversion of the Indians and the amelioration of their lot, and secured the prohibition of their enslavement. He became superior of the Jesuits of Brazil, where he died July 13, 1697.

were fortifications until 1858-60, when they were removed. Leopoldstadt, Brigittenau, and Floridsdorf lie on the left bank of the Danube Canal; dists. III to IX (the inner dists.) were surrounded by an outer girdle of fortifications until 1892, when a number of suburbs were incorporated into the city, nearly doubling its area. More suburbs were incorporated in 1902.

Vienna, with a pop. (1947) of 1,548,137, covers an area of 469 sq. m. Some 60 p.c. of the area is woodland and arable country; another 13 p.c. is public parks, private gardens, and open spaces. Congestion in the workers' districts is very great, but housing conditions were much improved by the building of large, well laid-out blocks of workers' flats by the municipality during the 1920s.

When the fortifications around the centre of the old city were removed, the Ringstrasse was built in their place, one of the longest, broadest, and handsomest streets in the world. A semicircle of Rings (boulevards), beginning and ending at the Danube Canal, the Ringstrasse is 2 m. long and 150 ft. wide. Vienna's most famous and most gracious buildings lie on it: among them the neo-Gothic *Votivkirche*; the city hall (*Rathaus*), built 1873-1883 in modern Gothic style; the *Burgtheater* in Renaissance style; the dignified parliament houses; the immense com-



Vienna. Plan of the central area of the Austrian capital, which has grown up around the Altstadt or old city, showing the principal buildings and thoroughfares

plex of the Hofburg, formerly the seat of the Hapsburg emperors, now national museums; the massive university building; the imposing opera house, built 1812-1818; the arts and the natural history museums, with one of the world's largest monuments, to the Empress Maria Theresa, between them; the palace of justice (Austria's law courts); the exchange; various ministries; famous hotels, and many private palaces and beautiful dwelling houses. The Ringstrasse is flanked by several fine squares and pleasant parks and public gardens, the largest being the Stadt Park. Vienna's most representative coffee-houses are also in the Ringstrasse. The names of the boulevards constituting the Ringstrasse have been changed several times with the change in Austria's status during the 20th cent.

Famous buildings not on the Ringstrasse include S. Stephen's cathedral, dating back in part to the 13th cent., at the very centre of the Innere Stadt, and with a 450 ft. spire (it was badly, but repairably, damaged by shelling and fire during the Second Great War); the ancient church of S. Augustin; the Capuchin church, with crypts and Hapsburg graves; the Maria-am-Gestade and the Minorite churches; and, on the outskirts of the city, the castle of Schönbrunn (q.v.), the park of which resembles

the gardens of Versailles. The Prater, a vast natural park, lies E. of the Danube Canal; it has avenues, immense coffee-houses, and the elaborate Volksprater, (Wurstelprater in Viennese slang), greatest perennial fun fair in the world, where stands the famous giant wheel, Vienna's second landmark, the first being the spire of S. Stephen's.

Vienna, formerly fourth largest city in W. Europe, had sunk in 1947 to fifth, after London, Berlin, Paris, and Rome. As in the rest of Austria, the people are predominantly R.C. Jews number a few thousands only; before Nazi deportations and exterminations, the city had some 180,000 Jewish residents who, in Hapsburg and republican days, played an important part in the city's commerce, press, and industry, theatrical and artistic life.

Though their language is German, the Viennese are by no means Teutonic. On the frontiers of German, Slav, and Magyar peoples, Vienna became a melting-pot for all three. In the days of the Austro-Hungarian empire, tens of thousands of Czechs used to live in Vienna; some thousands remained. There was a considerable influx of Poles and of Hungarians. Italians added a fair Latin sprinkling to this mixture. Despite a common language, there has never been much love lost be-

tween the Viennese and the Berliner. The pop. of Vienna differs also from that of the Austrian countryside, whose peasants and mountaineers, conservative and pious, have a different way of life from cosmopolitan Vienna.

The people of Vienna, reputed to be gay, genial, friendly, and pleasure loving—result of former court life, congenial climate, beautiful surroundings, and wine from the vines growing on the slopes of the Wienerwald (Vienna wood)—did not altogether lose these characteristics even under the miseries of war and occupation. Viennese women, famous for their charm, beauty, and style, made Vienna a dangerous competitor with Paris in the world of fashion. Viennese love of music and dancing flowered in the waltzes of Strauss and Lanner. Many songs describe the beauty of Vienna and the charm of its women; performance of classical music in two large concert halls and the state opera house is the pride of the Viennese.

The people love good food, and the cuisine of Vienna is world famous. It includes *Wiener Schnitzel* (escalope of veal), *Backhendel* (spring chicken), incomparable pastries and sweets, good local wines and beers, and very good coffee with whipped cream; the coffee owes its flavour to Vienna's excellent drinking water which is brought 60 m. by pipeline from the Alps. The chief beverages of the Viennese are sour wine grown in the vineyards near the city and beer of lager type. In summer, old and young swarm into the Vienna woodland to the numerous *Heuriger* (young wine) pubs where food and drinks are served in the open and Viennese tunes are played by a *Schrammelquartett* (piano, violin, guitar, and accordion). There are many restaurants, but more coffee-houses which, to the Viennese, are his second home, club, place of rest and recreation, reading room, and sometimes even the substitute for an office.

Vienna university (established 1365) is particularly famous for its medical faculty, and has been for generations a Mecca of science for young people of the Central European countries. The hospitals are up-to-date, and Vienna's specialists attracted patients from all over the world before the city came under Nazi domination in 1938.

In addition to the state opera house and the Burgtheater, home chiefly of the classics, Vienna has many other theatres, among them

the Volkstheater, and several devoted exclusively to operettas by Lehar, Strauss, and others, most famous of which is the Theater an der Wien. There are also two variety theatres. There are dance halls, bars, night clubs, cabarets, *Kleinkunst bühnen* (literary cabarets), etc., in abundance.

The picturesque Innere Stadt, dating from the Middle Ages, has narrow streets, small squares, ancient buildings, and many monuments. From the centrally situated St. Stephen's Square, two main arteries run: the Kärntnerstrasse, with its fashionable shops (Vienna's Bond Street), joins the Ringstrasse at the Opernkreuzung, Vienna's busiest traffic spot; the Rotenturmstrasse leads to the Franz Josefs Kai on the Danube Canal. The Graben (trench), with its Pestssäule (a column to commemorate the plague), built on the mass graves of the victims of the plague in the Middle Ages, is a fashionable thoroughfare.

There are very few bus routes in Vienna, though the tram network is well developed. Vienna also has an electric rly., partly underground, round the town. Once upon a time *Fiakers* (two-horse cabs) were popular.

Vienna is a 2 hrs.' run by train or car from the Alps; in the immediate neighbourhood are lovely resorts, e.g. Baden-bei-Wien, Vöslau, Gumpoldskirchen. On a dead branch of the Danube (Old Danube) rowing, yachting, swimming, fishing, and all water sports flourish. Within easy reach are the Danube swimming places of Klosterneuburg and Kritzendorf. Bathing and sunbathing are very popular. Dianabad in Vienna is certainly the largest and probably the most luxurious bath house in the world.

HISTORY. Vienna's German name, Wien, is derived from the name of a small trib. of the Danube. In the pre-Christian era, the Celtic settlement Vindomina stood on the banks of this stream. When the Romans fought their way to the north and captured Vindomina they renamed it Vindobona and built it up as a fortified camp. It was in Vindobona that Marcus Aurelius died in 180. Vienna's Hungarian name, Bécs (*pron. Batsch*), is probably of Slavonic origin. After the fall of the western Roman empire, Vienna was occupied first by the Huns and then by the Avars, and remained in obscurity for several centuries. When Charlemagne created the Ostmark (eastern district), nucleus

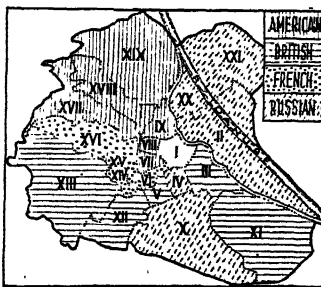
of future Austria, as a bulwark against the Avars, and made it a fief to the dukes of Babenberg, Vienna was so insignificant that Melk - an - der - Donau, and not Vienna, became the capital of the district and seat of the ruling house. However, the Babenberg Duke Heinrich Jasomirgott transferred the capital to Vienna in 1156, and during the crusades, the city, lying conveniently on the European crossroads from N. to S. and from W. to E., expanded in size and population.

In 1276, it became the seat of the Hapsburg dynasty, and capital first of the German and then of the Austrian empire. Hungarians besieged it, unsuccessfully, in 1480; but five years later, led by Matthias Corvinus, they captured and held Vienna for a short time. The Turks in their drive towards western Europe besieged Vienna in 1529 and 1683. That second siege would have been successful had it not been for the heroic stand of the garrison, under Duke Rüdiger von Starhemberg, and the help brought by the Polish King John III Sobieski, who, at the head of Polish and German troops, descended on the Turks from the Kahlenberg hill outside Vienna and inflicted on them the greatest land defeat of their history. That battle not only saved Vienna, it stemmed the Turkish drive towards western Europe.

French forces, under Bonaparte, marched into Vienna in 1805 and again in 1809. After the collapse of Napoleon's empire, the task of reorganizing Europe and reshaping its map was carried out during the congress of Vienna, 1814-15 (*v.t.*). When, in 1848, risings against the ruling despots broke out in many parts of Central

it, Vienna, as the capital once more of a mighty empire, again grew in size, importance, and pop., until, in 1910, it was inhabited by 2,031,498. In Nov., 1918, the Austro-Hungarian empire fell to pieces, the Hapsburgs were deprived of their thrones in Vienna and Budapest, and Vienna became the capital of the truncated Alpine republic of Austria. This drastic change meant that in 1920 a country of barely seven million inhabitants had a capital with a pop. of 1,842,005. Antagonism grew between the countryside and Vienna, called derisively *Wasserkopf* (one suffering from hydrocephalus). To alleviate this situation, Vienna was declared by the Austrian republican constitution to be not only the capital, but also an autonomous prov. having the same position in the republic as the other provs. (Lower Austria, Upper Austria, Styria, Salzburg, Carinthia, Tyrol, Vorarlberg, and Burgenland). Between the two Great Wars, Vienna's town council enjoyed the status of a diet. In it, the Social Democrats had a majority, while in the local govts. of other provs., and the federal govt. of the republic, the R.C. and conservative Christian-Social party were in a majority. That duality gave rise to the special brand of Austrian fascism (*Heimatschutzbewegung*) which, during and after the revolt of Feb., 1934, destroyed the predominance of the Socialists in Vienna. That Austrian fascism, for some time supported by Mussolini, fought not only the Socialists, but also the Austrian Nazis, who staged a revolt in Vienna in July, 1934, suppressed by the armed formations of the *Heimatschutz* and the Dollfuss govt.; Dollfuss himself was killed by the Nazi insurgents. Austrian fascist rule in Vienna came to an end on March 11, 1938, when Hitler's army invaded the republic and proclaimed its union with Germany. Under Hitler, Vienna was lowered to the status of the main city of Ostmark, as Austria was once more called.

During the Second Great War, Vienna was bombed a number of times before its capture on April 13, 1945, by Tolbukhin after more than a week's street fighting during which the E. dists. of the city suffered heavily, the buildings above the Danube Canal being reduced to rubble. After the war Vienna, though lying in the Russian zone of occupation in Austria, was, like Berlin, divided into British, U.S., French, and



Vienna, Austria. Map showing sectors of Allied occupation in 1945. Dist. I was under four-power administration

Europe, a revolutionary govt. was for a short time established in Vienna. During the 19th cent., particularly in the second half of

Russian sectors, the Innere Stadt being under four-power administration. At the same time, Vienna became once again the seat of a republican Austrian govt.

Vienna, CONGRESS OF. Meeting of plenipotentiaries of the European powers at Vienna in 1814-15 after the defeat of Napoleon and the entry of the allies into Paris. The purpose of the congress, which began sitting Sept. 20, 1814, was to determine the boundaries of the various states and to decide numerous questions arising out of the general resettlement. Castle-reagh represented Great Britain; Metternich presided as Austrian chancellor; the tsar sent Nesselrode; Hardenberg came for Prussia; and Talleyrand for France. The final settlement embodying all the separate treaties was signed June 9, 1815.

The chief results of the congress were as follows: France reverted to her old frontiers of 1792; Austria gave up the Netherlands but received E. Galicia and territory in Bavaria, in Italy, and on the Adriatic coast; Prussia got Posen and a part of Saxony; Russia got a portion of Poland and Finland; Norway was joined to Sweden; the Austrian Netherlands (the modern Belgium) were joined with the Dutch provinces to form the kingdom of the Netherlands; the Spanish monarchy was restored; the neutrality of Switzerland was guaranteed; the German confederation was reconstructed; while Great Britain secured Malta and the Ionian Islands, the Cape, Ceylon, some W. Indian islands, and Mauritius. See Europe: History. Consult: The C. of V., C. K. Webster, 1919; H. Nicolson, 1946.

Vienna Award. Name given to two frontier decisions made in Vienna during the Nazi regime. Under the first, Nov. 2, 1938, Germany and Italy having been invited by Czecho-Slovakia and Hungary to arbitrate on their frontier disputes, Ribbentrop and Ciano awarded to Hungary 4,200 sq. m. of Czecho-Slovak territory—nearly all she demanded. Part of the area was returned to Czecho-Slovakia, part went to the Ukraine (q.v.), after the Second Great War. Under the second Vienna award, Aug. 30, 1940, Germany and Italy having summoned representatives of Rumania and Hungary to that city, Ribbentrop and Ciano awarded to Hungary more than half of Transylvania. This award was cancelled under the peace treaty with Hungary, 1947.

Vienne. River of France. It rises in the dept. of Corrèze, on Mt. Odouze, flows W. through the dept. of Haute-Vienne, N. through Charente and Vienne depts., and N.W. through Indre-et-Loire, to meet the Loire about 9 m. above Saumur. Its tributaries include the Taurion, Briance, Clain, Creuse. Of its 223 m. c. 50 are navigable.

Vienne. Department of France. Formed of parts of Poitou, Berry, and Touraine, it lies adjacent to the depts. of Charente, Deux-Sèvres, Maine-et-Loire, Indre-et-Loire, Indre, and Haute-Vienne. It consists generally of broad plateaux separated by deep river valleys, chalky formations covering the N. parts and granite in the S.W. The river Vienne traverses the dept. from S. to N., and among many streams are the Clain, Creuse, Anzon, Auzances, Vonne, Gartempe, and Charente. Agricultural products include cereals and vines. Poitiers is the capital, other towns being Châtellerault, Civray, Loudun, Montmorillon, Lussac, Mirebeau, and Pleumartin. Vienne is rich in megalithic monuments. Area 2,711 sq. m. Pop. 313,932.

Vienne. Town of France, in the dept. of Isère. It stands on a hill above the confluence of the Gère with the Rhône, 1½ m. by rly. S. of Lyons. There are lead and copper mines in the vicinity. Industries include metal foundries and engineering, textiles, leather, paper, and glass works, and there is a busy trade in the fruit grown locally. The cathedral, seat of the archbishop who until 1792 was primate of Gaul, is in the Gothic of the 12th-16th centuries. Roman remains include the temple of Augustus and Livia, dating from

c. A.D. 41. A suspension bridge crosses the Rhône to St. Colombe. Known to the Romans as Vienna Allobrogum, Vienne was for a time capital of Burgundy, and became French in 1349. In unoccupied France during the Second Great War until Nov., 1942, it was liberated by U.S. forces Sept. 2, 1944. Pop. 23,519.

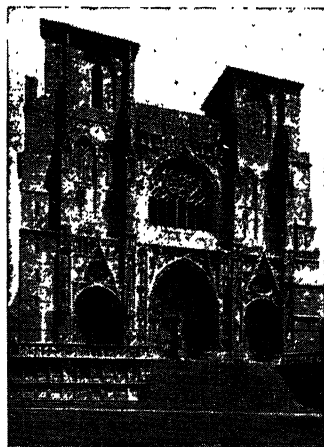
Vienne, COUNCIL OF. Fifteenth oecumenical council of the Church, convoked by Clement V, and held at Vienne, France, Oct. 16, 1311-May 6, 1312. The papal court had but recently moved to Avignon, and the council met under the pope's presidency to consider the charges against the Templars. That no influence should be lacking, Philip IV of France went to Avignon, and on March 22, 1312, the bull Vox Clamantis was issued, suppressing the Order for the sake of the public welfare. Disciplinary measures concerning other religious orders were taken, and resolutions passed on various ecclesiastical matters. See Council; Knights Templars.

Vientiane. Capital of Laos, Indo-China, French Union. Formerly an independent muong or principality, much of it was destroyed in 1828 by the Siamese, who made the surrounding territory over to France in 1893. Here is a well-equipped aerodrome. There is some small trade in timber, especially teak, and elephant, gaur, and tiger are hunted near by.

Vierge, DANIEL URRABIETA (1851-1904). Spanish artist. Born at Madrid, he studied at its academy, and going to Paris in 1867 obtained employment on Le Monde Illustré, and subsequently illustrated the works of Hugo, Michelet, and Francisco de Quevedo. His work was inventive and decorative at a time when book-illustration had sunk to a low level. Illustrations to Don Quixote, published in London in 1907, were especially noteworthy. He died in Paris, May 12, 1904.

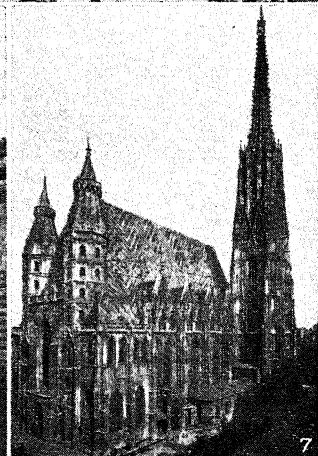
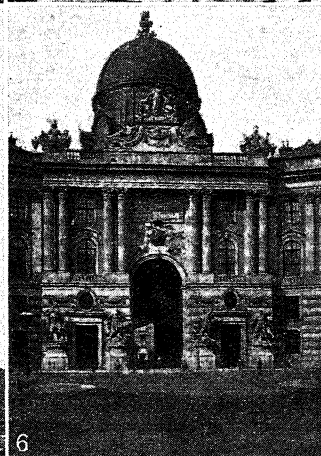
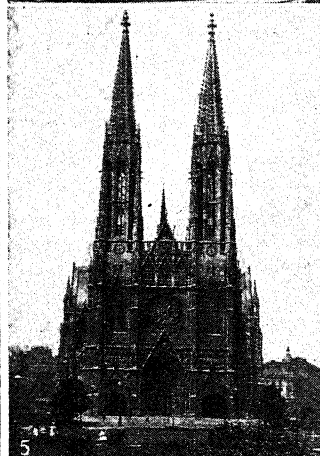
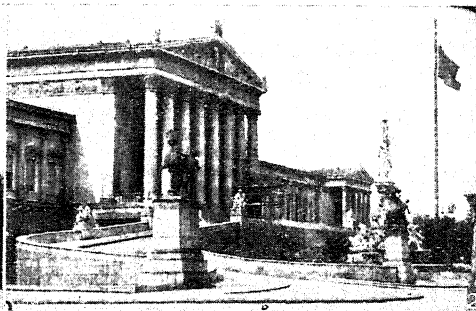
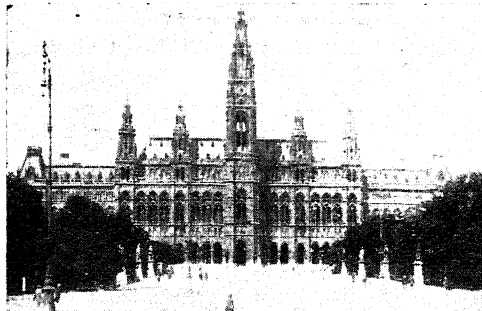


Daniel Vierge,
Spanish artist
Self-portrait



Vienne, France. The façade of the
Gothic cathedral of S. Maurice

Viersen. German town, in N. Rhine-Westphalia, on the Niers, 18 m. W. of Düsseldorf. It was an important rly. junction and a centre of the Rhenish textile industry, producing velvet, corduroy, and silk and cotton cloth, as well as machinery, furniture, and



1. Town hall, built 1872-82. 2. Houses of Parliament, dating from 1874. 3. Art and history museum, which houses one of the greatest art collections in the world. 4. Opera House, seating over 2,000 persons. 5. Votive church, built to celebrate Francis Joseph's escape from

assassination in 1853. 6. The New Hofburg, a former imperial palace. 7. Cathedral of S. Stephen, completed in 1230, from the south-west. 8. Church of S. Charles, dedicated in 1737, flanked with belfries resembling Trajan's column at Rome. 9. University, from Franzensring

VIENNA: ARCHITECTURAL FEATURES OF THE AUSTRIAN CAPITAL (Pre-War)

foodstuffs. Among four R.C. churches the fine late Gothic S. Remigius was much damaged during the Second Great War, when Viersen suffered heavily from air attack. The town was taken during the rapid U.S. advance at the end of Feb., 1945. Pop. 34,500.

Vierzon. Town of France, in the dept. of Cher. It stands on the river Cher, 49 m. by rly. S. by E. of Orléans, on the Canal du Berry, and is a busy industrial centre, famed especially for its manufacture of agricultural machinery. Pottery, glass, bricks, and tiles are other products. Pop. 26,017.

Vietnam. Associate state within the French Union. It is divided into the three *ky* of North Vietnam (Tongking), Central Vietnam (Annam), and South Vietnam (Cochin-China), each with its own administration. Total area, 124,000 sq. m. Pop. 22,000,000. Most of the people are of Annamite stock.

The history of Vietnam up to Sept., 1947, is given under Indo-China. In that month Bao Dai, emperor of Annam 1926-45, who had been living in Hong Kong since 1945, called Vietnamese leaders to a conference there. The result was an agreement with France, ratified Feb. 3, 1950, establishing the independence of Vietnam (Tongking and Annam) under Bao Dai's leadership and its adherence to the French Union. Cochin-China later voted for union with Vietnam. Bao Dai's govt. was recognized by the U.K. and the U.S.A.

The communist leader Ho Chi-minh ignored Bao Dai, and continued to harass both the French and the forces of Bao Dai's govt. On Jan. 14, 1950, his organization Viet-minh declared itself the govt. of Vietnam, and was immediately recognized, with Ho as president, by Russia and the Communist govt. of China. Viet-minh forces were in control of a considerable part of N. and Central Vietnam. In S. Vietnam, they had no real hold, though in detached areas there was heavy fighting. To combat Viet-minh, French troops in Vietnam were, during 1950, increased in number to more than 100,000; and in Dec. Gen. de Lattre de Tassigny was appointed c.-in-c., Indo-China.

Vigevano. Walled city of Italy, in the prov. of Pavia, in Lombardy, 24 m. S.W. of Milan. Macaroni, furniture, boots, and silk are chief products. Pop. est. 30,000.

Vigfusson, GUÐBRANDR (1828-89). An Icelandic scholar. Born March 13, 1828, he studied in

Copenhagen, where he lived until 1864. That year he made Oxford his home, and he remained there until his death, Jan. 31, 1889, having been university reader in Icelandic since 1884. Vigfusson's life work was to illuminate the early history of Iceland, and he compiled an Icelandic dictionary, edited various sagas, and, with his friend York Powell, was responsible for *Corpus Poeticum Boreale*, 1883.

Vigil (Lat. *vigilare*, to watch). Ecclesiastical term for the day of fasting before certain feasts. Originally the night was spent in watching and prayer. In the Church of England the festivals falling within the seasons of Christmas and Easter, apart from Christmas Day and Easter Day, have no vigils. In the R.C. Church matins and lauds and the midnight Mass before Christmas are the only survivals of the ancient custom. The term has also been applied to the practice of watching the bodies of the dead before burial. *See* Knighthood; Wake.

Vigilantes OR **VIGILANCE COMMITTEES.** Groups of men who, in the early days of frontier settlement in the western U.S.A., banded themselves together for mutual protection. They arose in districts where there were as yet no courts or officers of the law, and they inflicted summary justice upon persons believed guilty of crimes against person or property, especially horse-stealing. The punishments they inflicted ranged from lynching to driving an offender out of the township. After the normal legal processes became available, vigilance committees often continued to exist. *See* Lynching.

Vignette (Fr., little vine). Term used in the decorative arts in several senses. In the 16th century the word, often spelt *vinet*, meant a trailing border of grapes, leaves, branches, and tendrils of the vine, used in architecture, as borders for book pages, or adornment for dresses. In book decoration, a vignette is the group of ornamental flourishes round a capital letter, as in a MS., the engraved illustration on a title page, head and tail pieces and, in modern use, any illustration of which the background fades away to the tint of the paper. In a sense similar to the last, the term is also used in photography.

Vignola, GIACOMO BAROZZIO DA (1507-73). Italian architect and writer on architecture, also known as Barocchio. Born at Vignola, near Modena, Oct. 1, 1507, he studied painting without success at

Bologna, and then addressed himself to the science of perspective. From 1550 he practised architecture in Rome,



Giacomo da Vignola,
Italian architect

where he was attached to the papal court, and in 1564 became architect of S. Peter's in succession to Michelangelo. His best design was the palace of Caprarola, near Viterbo, built for Cardinal Alexander Farnese. But his treatise on the laws of the five orders of architecture, 1563, is, perhaps, his most noteworthy work. He died in Rome, July 7, 1573.

Vigny, ALFRED VICTOR, COMTE DE (1797-1863). French poet, dramatist, and novelist. He was born at Loches, March 27, 1797, and in his youth spent some years in the army. One of the earliest leaders of Romanticism, he published his first poems in 1822. *Alfred Vigny*



His verse, characterised by weight of thought and nobility of style, ranks with the finest philosophical poetry of his time and is his chief claim to fame. His prose fiction comprises an historical romance, *Cinq-Mars*, 1826; *Stello*, 1832; and three fine *nouvelles*, collected under the title *Grandeur et Servitude Militaires*, 1835. In the drama he produced, besides translations from Shakespeare (*Shylock*, *Othello*), and a short comedy, two prose tragedies, *La Maréchale d'Ancre*, 1830, and *Chatterton*, 1835, designed to realize his ideal of a drama, the interest of which should be purely psychological. Vigny was a proud and lonely man, and all his work is coloured by his profound pessimism and stoical temper. He died in Paris, Sept. 17, 1863. *See* Works, 1883-85; *Lives*, A. France, 1868; G. M. Paléologue, 1891; Dorison, 1892; Dupuy; 1910-12; Whitridge, 1933.

Vigo. Seaport of Spain, in the prov. of Pontevedra. It stands on Vigo Bay, 72 m. N. of Oporto, and on a branch rly. line 21 m. S. of Pontevedra. The fine harbour is a port of call for large steamers. The tunny and sardine fisheries, building of small steamers, and the manufacture of cordage are noteworthy. Foundries, machine shops,



Vigo, Spain. General view of the town showing the bay

paper and saw mills, petroleum and sugar refineries, chocolate and soap factories, tanneries, and distilleries are prominent industrial establishments. Wines, fish, cattle, and agricultural produce are exported. The port was twice attacked by Drake, in 1585 and 1589, and by a joint English and Dutch fleet in 1702, when the victors captured immense treasure and more was sunk with the Spanish galleons in the bay. It was also attacked by Cobham in 1719. Pop. 125,262.

Vihara. Dwelling for a Buddhist monk or image, in India and Ceylon. In European use the term commonly denotes also a monastery (*sangharama*). Of the great Brazen Monastery at Anuradhapura, Ceylon, built of nine storeys, about 100 B.C., and re-erected with five storeys about A.D. 400, only 1,600 stone pillars remain. Rock-cut viharas comprised at first unadorned rectangular meeting halls surrounded by cells, one- or two-storeyed. Gradually the pillars increased in number, with sculptural enrichments and image-shrines. So numerous were the monasteries in the ancient Magadha kingdom that it retains to this day the name of Vihara-land (Bihar).

Viipuri (Swed. Viborg). Town of Karelo-Finnish S.S.R. It is situated on a bay of the Gulf of Finland, at the mouth of the Saima Canal, 75 m. N.W. of Leningrad. Founded by the Swedes in 1293, it was formerly the capital of Karelia. It was taken by Peter the Great in 1709, and annexed to Russia by the peace of Nystad, 1721. Part of Finland after the First Great War, it was ceded to U.S.S.R. in 1940, a position confirmed by the peace treaty of Sept. 19, 1944. Pop. est. 30,000. See Finland.

Vijanagara or **HUMPI.** Ancient city of India, in Madras province. It flourished from its foundation in 1336 as a Hindu bulwark against

the Mahomedans, who sacked it in 1564. The temple dedicated to Vitoba, now in ruins, had boldly executed granite sculptures, and is the chief architectural relic. The finest remains of the Vijanagara dynasty are at Tarpitry, 100 m. S.

Vijose (Gr. Aoos). River of Albania. It rises E. of the Greek frontier and flows N.W. to enter the Adriatic Sea 14 m. N. of Vlonë. It is 120 m. long.

Viking. Name given to the Scandinavian sea-rovers and pirates of the 8th to 10th centuries. The Old Norse *vikingr*, Anglo-Saxon *wicing*, probably means a warrior, from *vig*, *wig*, war, although some derive the word from Old Norse *vik*, a creek. The Vikings sailed in colourfully decorated ships, and bore shields which were also brilliantly coloured. See Boat; Norman; Northmen; Norway. Consult A History of the Vikings, T. D. Kendrick, 1930.

Vilaine. River of France. It rises at Juvigné, dept of Mayenne, 17 m. N.W. of Laval, flows W. to

estuary in the dept. of Morbihan. The chief tributaries are the Ille, Meu, and Don, and towns on its banks include Vitré, Rennes, Mes-sac, Redon, and Laroche-Bernard. The Vilaine is met at Redon by the Brest-Nantes canal. Certain stretches of the river are navigable. Its length is 138 m.

Vilayet or **IL** (Turk., province). Name of the chief administrative divisions of Turkey. Each vilayet or *il* is governed by a vali (*ilbay*) or gov.-gen. and a provincial council. In the present republic there are 63 vilayets, each divided into cazas.

Vilcañota or **Cuzco.** Mountain mass of Peru, on the boundary between the depts. of Puno and Cuzco. It forms a connecting height between the E. and W. Cordilleras of the Andes. Alt. 19,500 ft.

Vill. Early English form of the Latin villa. It was used for a township or small rural settlement, the village of later times, and from it are derived also the words villein and villeinage. The Anglo-Saxon word *tūn* was usually translated as vill. Consult Township and Borough, F. W. Maitland, 1898.

Villa. Latin word meaning a country house, but now used in England for a residence of moderate size, usually a suburban one. Most wealthy Romans had their villas, and Latin literature contains frequent references to them. Perhaps the most magnificent was the one built by Hadrian at Tivoli. The name and idea were carried by the Romans into France, Britain, and elsewhere. In England the remains of several hundred are known. The normal type enclosed an open court, access to the dwelling apartments and offices being gained by a covered corridor. Villas were the unfortified residences of romanised British squires rather than of alien officials. Outstanding examples are at Woodchester, Winchcombe, and Chedworth, Glos; Bignor, Sussex; Mansfield Woodhouse, Notts; Brading, I.O.W.



Viipuri, Karelo-Finnish S.S.R. Gothic castle, dating from 1293, an ancient Swedish stronghold on the Russian frontier

Rennes, S. through Ille-et-Vilaine down a picturesque, hilly, and wooded valley, and in the marshy dist. of the Lac de Morin turns S.W. to enter the Atlantic at the deep

estuary in the dept. of Morbihan. The chief tributaries are the Ille, Meu, and Don, and towns on its banks include Vitré, Rennes, Mes-sac, Redon, and Laroche-Bernard. The Vilaine is met at Redon by the Brest-Nantes canal. Certain stretches of the river are navigable. Its length is 138 m.

Villa, FRANCISCO PANCRO (1877-1923). Mexican soldier. Born at Las Nieves, he was originally known as Doroteo Arango. His early life included banditry, and he became so notorious for his robberies

that President Diaz offered a large reward for his capture. Pardoned by Madero on the outbreak of revolution in 1910, in return for his services, Villa speedily gained fame as a guerrilla general. Exiled to the U.S.A., he came back after the murder of Madero, and in 1914 he sided with Carranza against Huerta. Then he changed over, defeated Carranza at Torreon, and made himself c.-in-c. and virtual dictator. Being outlawed, he invaded U.S. territory in 1916 in order to discredit the Carranza govt., and when the latter was recognized by the U.S.A., Villa resumed guerrilla attacks on it. Bought off in 1920, on July 20, 1923, he was assassinated. *Consult Viva Villa!*, E. Pinchon, 1933.



Francisco Villa,
Mexican soldier

Villach. Town of Austria, in Carinthia. Situated at the head of raft navigation on the Drave, 25 m. by rly. W. of Klagenfurt, it is a centre for the timber trade and makes articles of lead from the nearby mines. S. Jacob's church is 15th century Gothic. Pop. 30,788.

Villa de Cura. Town of Venezuela, in the state of Aragua. It is 56 m. by rly. S.W. of Caracas near the N.E. shore of Lake Valencia. Cotton goods are made. Fire destroyed most of the town in 1900.

Villafranca. Town of Italy, in the prov. of Verona. It stands on the Tartaro, 14 m. by rly. N. of Mantua, and 11 m. by rly. S.W. of Verona. In the 12th century castle, now in ruins, the preliminary treaty which ended the war between France and Austria was signed July 11, 1859, after the battle of Solferino. There are manufactures of silk goods.

Village (Lat. *villa*). Name given to a settlement smaller than a town. The typical village, found all over England, consists of a number of houses grouped round a church. The manor house stands near, and around there are usually farms. *Consult The English Village Community*, F. Seebohm, 1884; *The Medieval Village*, G. G. Coulton, 1925.

Village Community. Term applied to a group of settlers who built their houses close together and cultivated the surrounding land in common. Much research has been given to the subject, and scholars differ as to whether it was composed of free men or of serfs,

and on other matters connected with its origin and development, such as its relation to the mark and the manor. It is almost certain that something of this kind was found at an early date over a good part of Europe, and in Asia. *See Manor*; *Mark System*.

Villa Maria. Town of Argentina, in the prov. of Cordoba. This place, 343 m. N.W. of Buenos Aires, was in 1872 selected by the Argentine congress as federal capital of the country, but the decision never took effect. It is a rly. centre and has interests in dairying, cattle, timber, and grain, with a pop. of approx. 35,000.

Villani, GIOVANNI (c. 1275-1348). Italian historian. Having filled various public offices in his native Florence, including those of prior and master of the mint, Villani wrote a chronicle of the city, accompanied by a review of events from the building of the Tower of Babel down to 1348. This is particularly valuable for its survey of contemporary politics, commerce, and arts. When Giovanni died of the plague, his work was carried on by his brother Matteo (d. 1363), and continued to 1364 by Matteo's son Filippo, much inferior as an historian. Portions were translated into English by R. E. Selfe, 1896.

Villanueva de la Serena. Town of Spain, in the prov. of Badajoz. It is near the left bank of the Guadiana river, 180 m. by rly. S.W. of Madrid, in the middle of the plain of La Serena. Wheat, fruit, wine, are produced. Pop. 16,000.

Villanueva y Geltrú. Coast town of N.E. Spain, in the prov. of Barcelona. It is 31 m. by rly. W.S.W. of Barcelona city. Textiles form the chief manufactures, and there is considerable trade in the excellent local wine. Pop. 14,300.

Villa Real. Dist. of Portugal, the W. part of the prov. of Tras os Montes. It lies between the Douro and the Spanish frontier. The Paiz do Vinho, along the Douro, is the richest wine-producing area in the country. Cattle-rearing is the chief occupation elsewhere in the dist. Its area is 1,640 sq. m. Pop. 289,114.

Villa Real. Town of Portugal, capital of the dist. of the same name, in Tras os Montes. It is on the Corgo river, 18 m. by rly. N. of Regoa on the line from Oporto to Salamanca. Pop. 8,900.

Villari, PASQUALE (1827-1917). Italian historian. Born at Naples, Oct. 3, 1827, he removed to Florence after the failure of the anti-Bourbon rising of 1848, in which he

shared. He there devoted himself to a *Life of Savonarola*, published 1859-61, and was appointed professor of history at Pisa in 1859, and at Florence in 1862. As a publicist Villari had some part in expelling the Bourbons from Naples. The valuable Machiavelli and His Times came out 1877-82, new ed. 1912-14; and *First Two Centuries of Florentine History* in 1893-94. In 1867 Villari became a member of the chamber of deputies, and in 1884 of the senate, and was minister for education, 1891-92. He lived until Dec. 7, 1917. Most of his historical writings were translated into English by his wife Linda, an Englishwoman.

Villarreal. Town of Spain, in the prov. of Castellón. It is near the mouth of the Mijares river, 4 m. from the coast and 33 m. by rly. N.N.E. of Valencia. Near by is the Canal de Castellón, a Moorish engineering work which still supplies irrigation water to the neighbouring huertas. Woollens, spirits, and paper are manufactured. The town has declined since 1609, when the Moors were expelled. Population 19,700.

Villarrica. Capital of the dept. of Guaira, Paraguay. About 90 m. S.E. of Asuncion, to which it is joined by rly. and road, it lies in an agricultural region watered by the Tropicuary, and trades in tobacco and fruit. Pop. 31,081.

Villars, CLAUDE LOUIS HECTOR, DUKE OF (1653-1734). French soldier. Born of a noble family at



Duc de Villars,
French soldier

Moulins, May 8, 1653, he entered the army in 1671 and performed distinguished service in the Netherlands and against the Turks. His reputation made, he was given a cavalry command in 1690, and during the next 25 years was almost constantly in the field. One of the chief French generals in the War of the Spanish Succession, he was sent in 1702 to assist the Bavarian ally, gaining a signal victory at Friedlingen which brought a marshal's baton.

All other commanders having failed against Marlborough, Villars in 1709 was given the main army in Flanders, where on Sept. 11 he was beaten and wounded at Malplaquet. But he defeated Eugene at Denain in 1712, and two years later signed as plenipotentiary the peace of Rastatt. During the regency for

Louis XV, Villars was a prominent politician. He took the field again in the War of the Polish Succession, dying at Turin, June 17, 1734. His Memoirs were finally edited by the marquis of Vogüé, 1884-92.

Villarsia. Genus of marsh-herbs of the family Gentianaceae. They are natives of S. Africa and Australia. They have long-stalked, oval, roundish, or kidney-shaped leaves, and yellow or white bell-shaped flowers, in clusters.

Villaviciosa. Port of N. Spain, in the prov. of Oviedo. It stands on the Ría de Villaviciosa where a small stream enters the Bay of Biscay, and is 18 m. by road E. of Gijón. The sea fisheries and coasting trade provide the chief occupations. The Gothic church is of architectural interest. Pop. 24,000. At a village of this name 12 m. by rly. W. of Madrid, the French defeated the Austrians, Dec. 11, 1710.

Villefranche. Town of France. In the dept. of Rhône, it stands on the Morgon, near the right bank of the Saône, 21 m. by rly. N.N.W. of Lyons. It is a centre of cotton and clothing manufacture. There is trade in Beaujolais wine. The Gothic church of Notre-Dame-des-Maraîs was completed in 1518. Founded in 1212, Villefranche became capital of Beaujolais in the early 14th century. In unoccupied France 1940-42, it was liberated from the Germans Sept. 3, 1944. Pop. 20,017.

Villegas, ESTEBAN MANUEL DE (1589-1669). Spanish poet. Born Feb. 5, 1589, and educated at Salamanca, he became known by his translations of Horace and Anacreon, which, together with verse of his own, he published as *Las Eroticas*, 1617. He settled at Najera as a lawyer, but his outspoken opinions and liberal views attracted the notice of the Inquisition, and he was exiled for some months in 1659. He died Sept. 3, 1669.

Villehardouin, GEFROI DE (c. 1155-1213). French chronicler. Born at Villehardouin, near Troyes, he joined the Crusade in 1199 and took part at Venice in the complex negotiations for transport facilities in 1201. He showed fine soldierly qualities at Adrianople, 1205, supported the emperor Henry I, and in 1207 retired to Thessaly, where he had received certain fiefs, and held the title of marshal of Romania. In his retirement he wrote his story of the conquest of Constantinople, the first great historical work in French.

Villein (Lat. *villa*). Originally, one who worked on a villa. In the 11th century it became, in its Latin

form *villanus*, the usual term for most cultivators of the soil, and as such is used in Domesday Book, which enumerates about 100,000 villeins. Later the word became villain, with a sinister meaning.

Villeinage. State of being a villein. In England, while the manorial system prevailed, i.e. roughly from the 11th to the 15th century, a large proportion of the population were in this condition. They formed a class intermediate between the freemen and the slaves. Their position as defined by the lawyers was quite servile. They could not leave the land to which they were bound, and there are examples of their lords selling them with it. Their children were villeins by birth. Villeins were obliged to perform certain services to the lord of the manor, working on his land at certain times, and they had to pay him fines of various kinds. In practice, however, their position was somewhat better than in theory. They had by custom certain rights, and gradually the courts of law began to recognize these. Residence for a year and a day in a chartered town made a villein into a freeman. The end of the system was due mainly to the economic causes that broke up the manorial system, the black death, the growth of money payments, the substitution of contract for custom, and the greater mobility of labour. See *Manor*; consult also *Villeinage* in England, P. Vinogradoff, 1892; *History of English Law*, F. Pollock and F. W. Maitland, 2nd ed., 1911; *History of English Law*, W. S. Holdsworth, 1903-38.

Villena. Town of Spain, in the prov. of Alicante, on the Madrid-Alicante rly. A Moorish castle standing on a hill dominates the town. Silk, olives, wine, and brandy are produced. Pop. 18,000.

Villena, ENRIQUE DE (1384-1433). Spanish author. He was husband of the mistress of Henry III of Castile, and wrote some pseudo-scientific works, including one in 1425, on the evil eye. He is, however, remembered as the author of the first translation of the Aeneid of Virgil, 1428.

Villeneuve, PIERRE CHARLES JEAN BAPTISTE SILVESTRE (1763-1806). French sailor, born Dec. 31, 1763. He was a naval officer when the Revolution broke out, and, siding with

the new order, he rose to be admiral in the Republican navy, 1796. Saving his vessel at the battle of the Nile, he made his way to Malta. A favourite of Napoleon, he was given command of the Toulon squadron in 1804, but was defeated in 1805 at Trafalgar. Taken prisoner by the English, he was released the following year, and committed suicide at Rennes, April 22, 1806.

Villeroi, FRANÇOIS DE NEUVILLE, DUC DE (1644-1730). French soldier. Son of the marquis of Ville-



Duc de Villeroi, French soldier

roi, a marshal of France and the governor of the youthful king Louis XIV, he spent much of his boyhood as the companion of his sovereign. He became a soldier, and, having been made a marshal, succeeded Luxembourg as commander of the army in the Netherlands in 1695. In the early days of the War of the Spanish Succession he served in Italy, but at Cremona he was taken prisoner. He led the French to defeat at Ramillies, 1706. He died July 18, 1730.

Villers-Bocage. Village of France, in the dept. of Calvados. It lies in wooded country 15½ m. S.W. of Caen. Captured in the Second Great War, June 13, 1944, by the "Desert Rats," and lost to the Germans, June 15, after a violent tank battle in its streets, it had two houses standing after the R.A.F. dropped, June 30, 1,000 tons of bombs in 15 mins. on Panzer divs. moving up through it. The British captured the site Aug. 5. After the war Villers-Bocage was rebuilt in stone.

Villers-Bretonneux. Town of France, in the dept. of Somme. It is 10 m. E. of Amiens, and was the site of a Franco-German battle in 1870. In the First Great War the Germans captured it, April 23, 1918, but lost it next morning to British and Australian troops. A memorial to 10,866 missing Australians was later erected here.

Villette. The last novel by Charlotte Brontë, published as by Currer Bell in 1853. Based on the author's memories of Brussels, described as Villette, it contains much that is autobiographical. See *Brontës*, The.

Villeurbanne. Town of France in the Rhône dept. Though independently governed, it is in fact a suburb of Lyons, about 3 m.



Pierre Villeneuve, French sailor

E. of that city. Its important industry comprises chemicals, soap, dyes, varnishes, woollen and other textiles, engineering, and metal goods. There are no remarkable buildings, but a number of charity institutions, *e.g.* homes for blind, deaf, and dumb. The pop. was 28,000 in 1900, and 82,399 in 1946.

Villi. Minute projections on the mucous membrane or inner surface of the small intestine. Exceedingly numerous, they serve to increase enormously the area of the intestine which is brought in contact with food, and thus facilitate digestion.

Villiers, BARBARA. Maiden name of the mistress of Charles II created duchess of Cleveland (*q.v.*).

Villiers, CHARLES PELHAM (1802-98). British politician. Born Jan. 3, 1802, he was educated at St. John's College, Cambridge, and was called to the bar. In 1835 he was elected M.P. for Wolverhampton, and became associated with Cobden and Bright in the Free Trade agitation. He was president of the poor law board, 1859-66. When Villiers died, Jan. 16, 1898, he had sat as Liberal M.P. for Wolverhampton for 63 years.

Villiers, FREDERIC (1852-1922). British war artist and correspondent. Born in London, April 23,



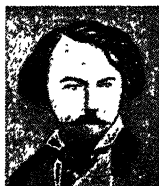
Frederic Villiers,
British war artist
Russell

1852, he was educated partly in France. As artist for *The Graphic*, *The Illustrated London News*, and other papers, he had experience in many campaigns, beginning with the

Serbian War in 1876, and including the Russo-Turkish, Burmese, and Greco-Turkish Wars, Khartum Expedition, 1898, the S. African and Russo-Japanese Wars, the Italian campaign in Tripoli, the Balkan Wars, and the First Great War. His publications include *Pictures of Many Wars*, 1902; and *Villiers: His Five Decades of Adventure*, 1921. He died April 3, 1922.

Villiers de l'Isle Adam, PHILIPPE AUGUSTE MATHIAS, COMTE DE (1839-89). French poet and sym-

bolist. A Breton count, he was born at St. Brieuc, claimed descent from a grand master of the Knights of Malta, and on



Villiers de l'Isle Adam,
French poet

the death of King Otto wanted to be a candidate for the throne of Greece. Impetuous, imaginative, influenced by Poe, Hegel, Wagner, and occultism, he lived for a time with the monks of Solesmes, and died of cancer in a Paris hospital, Aug. 18, 1889. Earliest of the symbolists, he wrote dramas (*e.g.* *Axël*, published posthumously); romances like *Isis*, 1862; short stories; and poetry. There are *Lives* by R. du Pontavice de Heussey, 1893, Eng. trans. 1904; V. E. Michelet, 1910; E. de Rougemont, 1910.

Villon, FRANÇOIS (b. 1431). A French poet of humble Parisian parentage. His own patronymic was Montcorbier, and he called himself Villon after a priest who became his benefactor. After some irregular attendance at lectures in the university of Paris, he became associated with a company of reckless young gallants who sang and jested their time away in taverns, and on June 5, 1455, he mortally injured Sermoise, a priest, in a brawl. Through the influence of the Paris parlement he was respited after receiving a death sentence. On a second occasion he escaped the hangman at Meung in 1461 only through a general gaol delivery on the accession of Louis XI. After a feverish career chiefly punctuated by larceny and libertinism, he found a quiet sanctuary in the house of the abbé de St. Maixent in Poitou, where he presumably died.



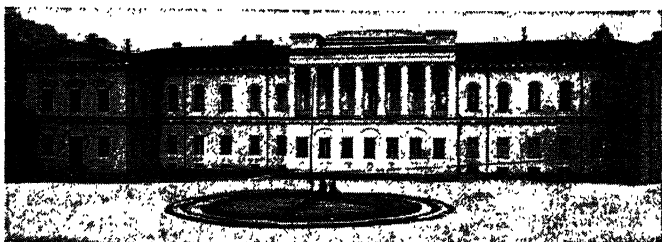
François Villon,
French poet

Villon's was a new voice in French literature. Gay, witty, and humorous, at once a cynic and a sentimentalist, he sinned and loved and suffered with the intensity of a strong and masculine nature. Regret and melancholy, lament for fugitive joy and the passing of beauty, are his themes. His first considerable work was *Le Petit Testament*, a mocking list of bequests to his graceless companions, drawn up on the occasion of his departure from Paris to Angers in 1456 to cure himself of a grand passion. A satirical survey of himself and his friends, it is a kind of preparatory sketch for his masterpiece, *Le Grand Testament*, 1461, a treasury of ballades and rondeaux charged to the brim with purest poetry. Bitter and ingenuous self-revelations, the Testaments are as free from hypocrisy as they are from boasting. Self-examination and confession, even piety, are there, but they are not followed by repentance. There is also *Le Jargon*, a collection of verse in Parisian slang.

Bibliography. Works, Bibliothèque Elzévirienne, Paris, 1854; ed. L. Thuasne, 1923; Eng. trans. G. Atkinson, 1930; H. B. McCaskie, 1946; *Lives*, G. Paris, 1901; P. Champion, 1913; D. B. Wyndham Lewis, 1928; I. Siciliano, 1934; C. Mackworth, 1948.

Vilna (Lettish, Vilnius; Polish, Wilno). Russian, and usual English, name for the capital of Lithuania S.S.R. It stands at the confluence of the Vileika and Vilja, nearly 60 m. E.S.E. of Kaunas, and is a rly. junction for Leningrad and Warsaw. An ancient and irregularly built place, it is rich in historical association, and is commercial rather than industrial.

Before the Second Great War, in which it was badly damaged, the pop. was 207,750. S. Stanislas cathedral (R.C.) was built in 1387, restored 1801, and possessed the silver coffin of S. Casimir; S. Nicolas (Greek) dated from 1596-1604; the Orthodox cathedral, dedicated to the Virgin, was the seat of an archbishop. It had



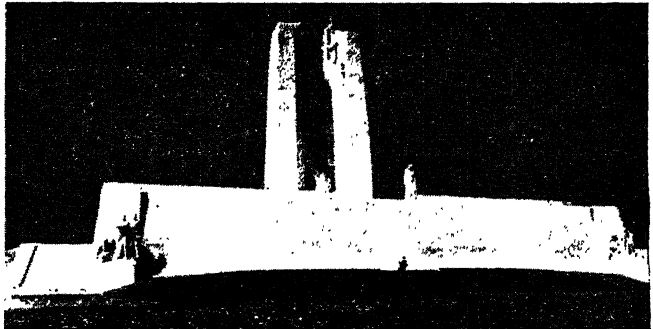
Vilna, Lithuania S.S.R. The Palace of the Republic

other medieval churches and monasteries, and ruins of a castle of the Jagellon dynasty, as well as botanical gardens and a museum of antiquities. A university was inaugurated in 1940. In normal times grain and timber are exported, tobacco, candles, leather and knitted goods are produced.

First mentioned as an important fortified town in 1128, Vilna became the capital of Lithuania in 1323. It was united with Poland when its prince Casimir IV was elected king of Poland in 1447. A centre of Jewish as well as Polish culture, it had a printing press by 1519, but in the international wars of the 17th century it suffered disaster. Russia annexed it at the final partition of Poland, 1795. Seized by the Germans in 1915, it was a bone of contention when Poland and Lithuania were resurrected as nations at the Paris conference of 1919. Polish troops took the city in 1920 after the Bolsheviks had handed it to the Lithuanian authorities; and the treaty of Riga, 1921, assigned Vilna to Poland. At the outbreak of the Second Great War Russia occupied Vilna, Sept. 19, 1939, and transferred it to Lithuania, Oct. 10. On June 27, 1941, it fell to the Germans, to be liberated July 13, 1944, by Chernyakhovsky's 3rd White Russian army after five days' fighting in the streets which severely damaged the town and cost the Germans 8,000 slain and 5,000 prisoners. Chernyakhovsky, killed in E. Prussia, is buried here. See Lithuania.

Vimeiro. Village of Portugal. In the prov. of Estremadura, it is 7 m. from Torres Vedras and 31 m. northwards from Lisbon. Here on Aug. 21, 1808, was fought the first important battle of the Peninsular War. Wellington, with about 20,000 men, had pushed forward to Vimeiro when he was attacked by the French, whose numbers were somewhat fewer. His position was strong and the attack, although pushed with courage and resolution, was repulsed. The French fell back in disorder, but Sir Henry Burrard, who was in supreme command, refused to pursue.

Viminal or **VIMINALIS.** One of the seven hills of Rome, E. of the Quirinal and N.N.W. of the Esquiline. So called from the osiers (*vimines*) which grew on it, the name Viminus was given to Jupiter, who had a temple there. To the N. were the *thermae*, or baths, of Diocletian.



Vimy Ridge, France. Memorial to Canadians who stormed the height in the third battle of Arras, 1917. It was unveiled by Edward VIII, July, 1936

Vimy Ridge. Upland of France. In the dept. of Pas-de-Calais, it is 5 m. N. by E. of Arras, and 476 ft. in height, and is an E. spur of the Notre Dame de Lorette. In the First Great War the village was captured with Petit-Vimy by the British, April 13, 1917. The ridge, dominating the Arras sector, passed into the hands of the Germans early in the war. Unsuccessfully attacked by the French under Foch in June and Sept., 1915, it was stormed by Canadian troops, April 9-10, 1917, in the third battle of Arras, and thenceforth was held by the British. In July, 1936, Edward VIII unveiled here a memorial to 11,285 missing Canadians. See Arras, Battles of.

Viña del Mar. Seaside resort of Chile. Situated on the coast, 5 m. S.E. of Valparaíso, it has frequent buses and trains, which carry many city workers. It is a fashionable holiday resort, with a season from Dec. to Feb. It has a racecourse, swimming pool, and many other sporting facilities. Notable among S. American hotels is the O'Higgins Hotel at Viña del Mar. Pop. 70,013.

Vincennes. Town of France, suburb of Paris, in the dept. of Seine. It lies 5½ m. S.E. of Notre Dame, Paris, and 2 m. outside the fortifications, connected with the city by rly. There are distilleries, metal and engineering works, chemical, piano and organ, rubber, and fancy goods manufactures; market gardening is carried on. Among important military establishments are the school of military administration, founded 1875, and the arsenal. The Château of Vincennes dates from the 14th century.

The Bois de Vincennes is a park between the fortifications and the right bank of the Marne, which became the property of Paris in 1860. Louis VII built a hunting seat here in 1164, and here Henry V of England died in 1422. Louis XI

converted the keep of the château into a state prison; among famous prisoners have been Henry of Navarre, the Condés, Cardinal de Retz, Diderot, and Mirabeau. The chapel of Francis I's castle here was burned out during the Second Great War. Vincennes was the scene of the execution of the duke of Enghien, 1804, and of various spies and traitors during the First Great War. Pop. 49,226.

Vincennes. City of Indiana, U.S.A., the co. seat of Knox co. It stands on the Wabash river, 118 m. S.W. of Indianapolis, and is served by the Cleveland, Cincinnati, Chicago and St. Louis, and other rlys. Its industrial manufactures include shoes, paper, flour, canned food, and steel bridges. A French fur-trading post was established here in 1683; it became a centre of glass manufacture in 1837. Vincennes was the capital of Indiana Territory, 1800-14, and became a city in 1856. Pop. 18,228.

Vincent (d. 304). Spanish saint and martyr. He was educated by Valerius, bishop of Saragossa.



Vincennes, France. Ancient keep of the castle-fortress, which has held many famous prisoners

Apprehended during the persecution of Diocletian, and taken to Valentinia, he died after tortures inflicted by the governor Dacianus. His day is Jan. 22.

Vincent, Sir Charles Edward Howard (1849-1908). British politician and police organizer. Born May 31, 1849, and educated at Westminster, he entered the army in 1868, but resigned five years later, and was called to the bar in 1876. He acted as correspondent for the Daily Telegraph at the beginning of the Russo-Turkish war of 1877-78. He studied the police systems of Paris, Brussels, Berlin, and Vienna, and was appointed the first director of the C.I.D. at Scotland Yard, 1878. Resigning in 1884, he entered parliament for Central Sheffield the following year, and was largely responsible for the First Offenders Act, 1887, the Alien Immigration Act, 1901, and for the appointment of the Public Trustee, 1906. He was knighted in 1896, and died at Mentone, April 7, 1908.

Vincent, John Heyl (1832-1920). Bishop of the American Methodist Episcopal Church. He was born at Tuscaloosa, Alabama, Feb. 23, 1832, began to preach at the age of 18, was elected bishop in 1888, and from 1900 to 1904 was representative of his Church in Europe. He was one of the founders of the Chautauqua (*q.v.*) Assembly and wrote *The Chautauqua Movement*, 1886; *The Modern Sunday School*, 1900; and *Family Worship for Every Day in the Year*, 1905. He died May 9, 1920.

Vincent, William (1739-1815). British divine. Born in London, Nov. 2, 1739, and educated at

Westminster School and Trinity College, Cambridge, he became assistant master at Westminster School in 1771, in which year he was ordained, and was appointed head-

master in 1788. In 1802 he became dean of Westminster, and did much useful work in restoring the fabric of the abbey. Famed as a scholar and educationist, Vincent wrote *A Defence of Public Education*, 1801, and *Commerce and Navigation of the Ancients in the Indian Ocean*, 1807. He died Dec. 21, 1815, at Islip, of which he had been rector since 1805, and is buried in Westminster abbey. He gave his name to Vincent Square, London.



William Vincent,
British divine

Vincent de Paul (1576-1660). French priest and saint. Born at Pouy, near Dax, in Gascony,

April 24, 1576, the son of a small farmer, he was educated at a Franciscan school at Dax, and later at Saragossa and Toulouse, earning his living as a private tutor.

In 1600 he was ordained priest, after which he continued his studies for four years. Captured at sea by Turkish pirates, he was sold into slavery at Tunis, but escaped to France, 1607. After a visit to Rome, he made his way to Paris, becoming almoner to Margaret of Valois in 1610, curé of Clichy in 1612, and in 1617 curé of Châtillon les Dombes. Here Vincent founded in 1624 the Order of Mission Priests, which was later established at St. Lazare, Paris, and became known as the Lazarist Fathers (*q.v.*). In 1632 he started the Daughters of Charity, the first order of unclioistered women devoting their lives to works of charity among the poor. He established the Foundling Hospital in Paris, and worked on behalf of galley slaves. In 1649 he sent out the first mission to the natives of Madagascar. He died in Paris, Sept. 27, 1660, and was canonised in 1737. Consult *Lives*, J. A. Adderley, 1901; H. Lavedan, Eng. trans. 1930.

Vincentians. Alternative name for the Congregation of the Priests of the Mission, better known as the Lazarist Fathers (*q.v.*).

Vincent's Angina. Ulcerative condition of the throat caused by two germs: the bacillus and spirillum of Vincent growing in symbiosis. The onset is accompanied by fever, malaise, and enlargement of the glands of the neck on the affected side. In due course the ulcer heals, generally without complication. Treatment consists in mild antiseptic applications, or, in suitable cases, the painting of the area with, and an intravenous injection of, one of the arsenical preparations.

Vinci. Village of Italy. On the Arno, 8 m. N.N.E. of San Miniato, it is famous as the birthplace of Leonardo da Vinci (*q.v.*). During the Second Great War the portico and tower of S. Ansano's church were destroyed by a bomb.

Vindelicia. One of the Danube provinces of the Roman empire. It

comprised roughly N. Tirol, a portion of N.E. Switzerland, and S. Bavaria and Württemberg. Its Celtic inhabitants were subdued by Tiberius in 15 B.C., when the country became a province, with Augusta Vindelicorum (mod. Augsburg) as capital. See Rome.

Vindhya. Hill range of India. It forms part of the N. edge of the Deccan plateau with a steep slope S. to the Narbada valley and a more gentle slope N. to the Malwa plateau. The E. end is continued across broken hill country by the Kaimur Range and the Rajmahal Hills to the Ganges near Bhagalpur.

Vindhya Union OR **VINDHYA PRADESH**. State of the Union of India, formed by a union of the 35 former Bundelkhand and Baghelkhand states of India, which joined together in 1948. The largest states were Rewa, Chhatarpur, Charkhari, Panna, and Orchha. The maharaja of Rewa was first rajpramukh. Pop. (1950 est.) 3,880,000.

Vindictive. British cruiser, famous for her part in the attack upon Zeebrugge (*q.v.*) in the First Great War, April 23, 1918. The Vindictive, then an obsolete ship of 5,700 tons, which had been specially fitted up for the purpose, went alongside the mole and landed a party of men in the face of heavy enemy fire. She got safely away from Zeebrugge on May 10, but was run into Ostend Harbour and sunk to block the channels. She lay there until raised and berthed in 1920; later the salvaged vessel was broken up.

Vine (*Vitis vinifera*). Climbing shrub of the family Vitaceae. It is believed to be a native of Asia Minor, but as grape stones have been found in European Bronze Age graves, it has been cultivated from the earliest times, and there is no certainty as to its origin.



Vine in the gardens of Hampton Court Palace, planted in 1768

It has slender woody stems of great length, which cling to trees by tendrils. The large, lobed leaves have toothed edges, and the small, green flowers are clustered in racemes. The five petals are united above and free below, so that the expansion of the stamens throws them off entire. They are succeeded by berries (grapes) containing two or four hard seeds. Numerous varieties have been produced with fruit varying in colour from purple to green.

The grape vine is believed to have been introduced to Britain by the Romans; and in Saxon times vineyards were numerous. But the climate of the U.K. is more conducive to production of foliage than to the ripening of the fruit. In the '60s and '70s of the 19th century European vines were almost exterminated by the attack of vine aphid (*Phylloxera vastatrix*) introduced from N. America. The trouble was afterwards reduced by grafting the vine on rootstocks of the American summer-grape (*V. aestivalis*) and fox-grape (*V. labrusca*). (See *Phylloxera*.) The genus *Vitis* includes about 40 species. See Australia; Douro; Grape.

Vinegar (Lat. *vinum*, wine; *acer*, sharp). Sour liquid originally obtained from wine by fermentation. The action was due to a micro-organism, the bacterium *Mycoderma aceti*, which in the presence of air promoted the oxidation of alcohol to acetic acid (*g.v.*); this scientific explanation being due to Pasteur. Until the 17th cent. vinegar was a by-product of wine making. Later a separate industry used alcoholic liquor specially prepared for the purpose. The original slow process consisted in exposing alcoholic liquor in casks to the action of air. These casks held 50 to 100 gallons, and were about half filled with beech shavings previously impregnated with vinegar. After about 6 months the alcohol was wholly converted to acetic acid.

In the quick process now generally used, the liquor is allowed to trickle through a layer of beech shavings supported on a false bottom in a large vat. Air is admitted below the false bottom and the temperature maintained at 41° C. Once started, the heat of reaction is sufficient to maintain this temperature. The liquor is returned to the top of the vat until conversion is complete in about 14 days.

Ordinary vinegar made from malt contains about 6 p.c. acetic

acid. In addition there are small amounts of other organic acids and esters, with sugar dextrin and traces of natural colouring matter. Wine vinegar has 6-12 p.c. of acetic acid and about 0.25 p.c. of tartar, which distinguishes it from malt vinegar. Cider and perry will also serve as bases for vinegar.

Vinegar Eel (*Anguillula aceti*). Minute nematode worm which sometimes occurs in vinegar.

Vinegar Hill. Eminence in co. Wexford, Eire, just outside Enniscorthy. In May, 1798, a force of rebels 15,000 strong gathered together in Wexford and formed a camp on Vinegar Hill, whence they carried on a series of outrages on the Protestant royalists in the neighbourhood. They were easily defeated by a force under Lake, their leader, Father Murphy, being slain. See Ireland; consult also History of the Rebellion, J. B. Gordon, 1803: History of England in the 18th Century, W. H. Lecky, 1878-90.

Vinegar Plant. Name given to a tough layer of a slimy character found on the surface of fluids, originally saccharine, which have become alcoholic through the breaking up of the sugar by the action of the yeast. Where this appears the alcohol is converted into acetic acid. The mass consists of numerous layers of minute threads of fungi and bacteria. The element in this heterogeneous mass to which the production of vinegar is due appears to be the bacterium *Mycoderma aceti*.

Vines, SYDNEY HOWARD (1849-1934). British botanist. Born in London, Dec. 31, 1849, and educated at Christ's College, Cambridge, and London university, he specialised in the botanical side of biology. He assisted Thiselton-Dyer in the S. Kensington botanical course of 1875, and, returning to Cambridge, became fellow of Christ's in 1876 and reader in botany to the university in 1883. In 1888 he migrated to Oxford, and was Sherardian professor of botany until 1919. F.R.S. In 1885, he was president of the Linnean Society, 1900-04. He lived till April 4, 1934. His publications include A Student's Text-book of Botany, 1895.

Vingt-et-un (Fr., 21) OR PONTOON. Card game played by any number of persons, four to six being best. The full pack is used, court cards each counting 10 and aces either 11 or one, at the option of the holder. Suits are immaterial. The dealer gives one card to each

player, including himself, the cards being face downwards. Each then places upon his card a stake, which the dealer may double or treble; and a second card all round is distributed, after which the hands are examined. The object of the game is to obtain 21 or as near that number as possible, but not above it, by the pips on the card. The dealer negotiates with each player in turn, and each may stand by the two cards received; or purchase another unseen; or take one free which the dealer sees ("twist"); and so on to a fourth or fifth card, but any score over 21 loses the stake. When all the players are either satisfied or "bust," the hands are exposed upon the table. Those nearer 21 than the dealer receive from him, while those with equal or inferior hands pay. If the dealer "busts" in taking extra cards he pays everybody still in. A natural, i.e. an ace and a ten dealt in the first two cards, entitles the recipient to double or treble stakes, as agreed, and to become dealer. A holding of five cards totalling less than 22, or any cards scoring 21 exactly, is paid double.

Vinh. Seaport of Central Vietnam (Annam). It is on the W. coast of the Gulf of Tongking and on the rly. between Hanoi and Hué, 200 m. N.W. of Hué.

Vinnitza. Town of Ukraine S.S.R., capital of a region of the same name. It lies 120 m. S.W. of Kiev, on the river Bug, at its junction with the Vinnichka. It dates from the 14th cent. and was formerly fortified. It had a Jesuit college founded in 1649, and under the Soviet regime developed into an industrial town of some importance, among its products being tobacco, vehicles, soap, and candles. Overrun by the Germans in Sept., 1941, it was recaptured by Zhukov's 1st Ukrainian army March 20, 1944, in a frontal assault combined with an outflanking movement. Pop. (1939) 92,868.

Vinogradoff, SIR PAUL (1854-1925). An Anglo-Russian scholar. Born at Kostroma, Russia, he became a professor of history at Moscow university. An enthusiastic educationist, his attitude brought him into conflict with the authorities in tsarist Russia, and about 1890 he

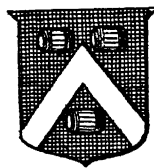


Sir Paul Vinogradoff,
Anglo-Russian
scholar

left for England. He devoted much study to the economic condition of early England, and in an article in the *English Historical Review* destroyed the old theory of folkland, substituting the notion that the manor grew out of a free village community—accepted as correct by practically all authorities. Villainage in England, 1892, was an exhaustive examination of this and other obscure problems. Other books include *The Growth of the Manor*, 1905; *English Society in the 11th Century*, 1908; and *Works in Russian*. In 1903 he went to Oxford as professor of jurisprudence, and in 1920–22 published *Outlines of Historical Jurisprudence*. Knighted in 1917, Sir Paul died Dec. 19, 1925.

Vintage. Literally the yield of a vineyard or vine-growing district for one season. The term specifically indicates the typical qualities of wine resulting from a notably good growth, maturing, and harvesting of grapes. *See* Wine.

Vintners' Company. London city livery company. Incorporated by charter in 1437, granted arms in 1447, and called originally the Merchant Wine-Tonnars of Gascoyne, it had two classes, wine importers and inn-keepers, and exercised powers over the imports and sale of wines



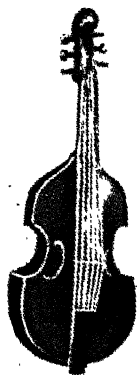
Vintners' Company arms

and the licensing of taverns. That part of the city known as the Vintry was once a centre where the vintners chiefly resided. The hall in Upper Thames Street is on land given by Sir John Stodeye; the original hall and adjacent almshouses were destroyed by the Great Fire of 1666, after which the new almshouses were erected in the Mile End Road, the hall being rebuilt by Wren, 1671, and largely altered in 1820–23. The oak carvings in council chamber and hall are attributed to Gibbons. The Vintners and Dyers are the only companies who may keep swans on the Thames. *Consult* The Vintners' Company, ed. T. Milbourn, 1888.

Vinyl Plastics. This class of synthetic materials is described in the entry on Plastics.

Viol. Name of a family of bowed instruments, dating from the 11th century. In general appearance it somewhat resembled the violin type, but there were really important differences. The back of the viol was flatter and

its ribs deeper, while the shoulders, instead of being round and meeting the neck at right angles, were



Viol, tenor 6-stringed instrument

sloping and met it at a tangent. The sound-holes were usually c-shaped instead of f-shaped, and the strings were five to seven in number instead of four, the tuning being in fourths and one third. There were several sizes, principally the Treble or Discant, the Viola da Braccio (or arm viol),

the Viola da Gamba (or leg viol), and the Violone (or double bass viol), the only one still in use.

Viola. Bowed instrument of the violin type. It is about one-seventh larger in size, and has its four strings a fifth lower in pitch, its tone being less brilliant.

Viola. Leading female character in Shakespeare's *Twelfth Night*. Wrecked on the coast of Illyria, she becomes page to Orsino, the duke, under the name of Cesario, and, herself secretly in love with him, is employed in love-embassies to the countess Olivia, who, rejecting the duke's suit, makes court to his page.

Violaceae. Family of herbs and shrubs. Natives of the temperate and tropical regions, they have leaves undivided or cut in from the margins, and before expansion the edges are rolled in. The flower parts are in fives, the lower stamens with spurs which secrete nectar. The fruit is a three-valved capsule. The best known genus is *Viola* (violet and pansy). The bedding viola, a cross between *V. cornuta* and *V. lutea*, resembles a pansy, but grows more profusely, and is usually self-coloured.

Violet (*Viola*). Large genus of low herbs, mostly perennial, of the above family Violaceae, natives of all temperate regions. Eleven species are recognized as British, including such well-known forms as the sweet violet (*V. odorata*), the dog violet (*V. canina*), and the heartsease (*V. tricolor*)—the last an annual. The flowers are irregular, for five petals form two pairs of different size and an odd

petal. In many species, as in the sweet violet, the odd petal is lengthened behind to form a hollow tube in which nectar is produced. The anthers form a close ring around the style, and the dry pollen shed into the enclosed space cannot fall until a bee, seeking the nectar, dislocates the ring and gets its head dusted. The fruit is a capsule which splits into three valves, and these by their contraction hurl the hard, polished seeds to a great distance.

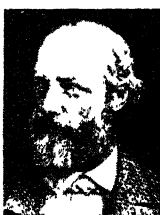
Violin. Bowed instrument of great importance in modern music. It dates back for some three and a half centuries, and since the early 18th century its form, as settled by the great Italian luthiers, has undergone no radical change. Its size, shape, and proportions are based (a) on the manner of holding and bowing the instrument; and (b) on the production of a full, powerful, and brilliant tone. The principal parts that make up a violin are: (1) a resonant body, consisting of an arched belly and back, united by ribs; (2) a finger-board; (3) a neck, terminating in a head or scroll; and (4) four strings carried from a tailpiece over a bridge on the belly to tuning-pegs in the end of the neck. The strings, tuned in fifths (E, A, D, G), are of gut, the lowest being covered with silver, silvered copper, or gold wire, and the highest being often of steel wire. The strings are set in vibration by a horse-hair bow held in the performer's right hand, the fingers of the left hand being pressed upon them as required. The violin's compass of about 3½ octaves is from G below the treble clef to C above the fifth ledger line above it; higher notes are obtained by harmonics (*q.v.*) *See* Position; Stradivari. *Consult* Violin Making As It Was and Is, E. H. Allen, 1946.

Violet-le-Duc, EUGÈNE EMANUEL (1814–79). French architect and author. Born in Paris,



Violet. Flowers and leaves of the British wild violet, *Viola canina*

Jan. 21, 1814, he studied architecture under Leclerc, and made a tour of investigation of classic remains in Italy and S. France. He was appointed architect of the abbey of S. Denis, and in 1853, when recognized as the leader of the Gothic revival in France, a govt. inspector-general of religious buildings. He spent ten years restoring Notre Dame. In the siege of Paris he acted as military engineer. He is remembered especially by his *Dictionnaire Raisonné de l'Architecture Française du XI-XVI^e Siècle*, 1854-68, and *Histoire de l'Habitation Humaine*, 1875. He died at Lausanne, Sept. 17, 1879.



E. Viollet-le-Duc,
French architect

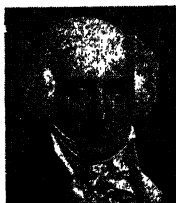
Violoncello. Bass violin tuned an octave below the viola (*q.v.*), but held between the legs of the performer as was the viola da gamba. It generally plays the bass part in orchestral music, but it is also valuable for sustaining a



Violoncello, bass
stringed instrument

sad or moving melody, especially in the tenor range.

Viotti, GIOVANNI BATTISTA (1753-1824). Italian musician. Born at Fontanetto da Po, May 23, 1753, he studied the violin under Pugnani at Turin, accompanying his master to Germany and Russia, 1780-81. Playing in London and Paris, 1782-83, he was acclaimed the greatest French violinist alive, but he discontinued concerts in order to compose and conduct at an opera house in Paris, 1789-93. Compelled by the



G. B. Viotti,
Italian musician

Revolution to flee, he helped to put on Italian opera in London. Director of the Opéra in Paris, 1819-21, he died in London, March 3, 1824. Viotti wrote 29 concertos for violin and orchestra, 18 sonatas, and quartets, trios, etc.

Viper. Large tribe of poisonous snakes. They are usually characterised by thick bodies, flat and triangular heads, vertical pupils to the eyes, and short tails. All are venomous, and most viviparous. The true vipers (*Vipera*) include some ten species, found in Africa, Europe, and part of Asia. The sand viper is found in S. Europe, where it preys upon small birds and mammals, lizards and snakes. Russell's viper occurs in the sub-continent of India, Ceylon, and Siam; its bite is almost as deadly as that of the cobra. The common viper or adder (*V. berus*), common in Europe and Asia, is the only venomous reptile occurring in Great Britain. See Adder; Horned Viper; Snake.

Viper's Bugloss (*Echium vulgare*). Biennial bristly herb of the family Boraginaceae. It grows native in Europe, W. Siberia, and N. Africa.

The stout stem is three or four feet in height, the lower part clothed with lance-shaped or oblong leaves, the upper crowded with short lateral sprays of flowers. The flowers are funnel-shaped, red-purple before they open, then a beautiful bright blue—occasionally white. The fruit consists of four wrinkled, angular nutlets.

Vipurī. Variant spelling of Viipuri (*q.v.*), on the Gulf of Finland.

Viracocha or **UIRACOCOA.** Ancient Peruvian deity. A creator-god, he was apparently the old tribal deity of the Colla people in the Titicaca basin. He was adopted by the Incas, when they subjugated that region, as a water deity.

Virangam. Town of India, in Ahmadabad dist., Bombay state.

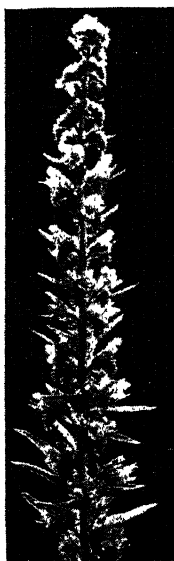
It is a rly. junction 40 m. W. by N. of Ahmadabad. It has a large trade in cotton.

Virchow, RUDOLF (1821-1902). German pathologist. Born at Schivelbein, Pomerania, Oct. 13, 1821, he had a medical training in Berlin, and in 1847 was appointed lecturer at its university. The same year he was appointed to study the causes and cure of typhus. Professor of pathological anatomy at Würzburg, he moved in 1856 to the similar chair in Berlin. He was elected to the Prussian diet, 1862, and became leader of the opposition. In 1858 Virchow published his *Cellular Pathology*, which stamped him at once as one of the greatest and most original thinkers of his profession. In it he laid down the famous dictum "All cells from a cell." The pathological institute in Berlin was set up by the government at the instance of Virchow, who lived until Sept. 5, 1902.

Virgate (Lat. *virga*, rod). Old English measure of land. At the time of Domesday Book and probably later it was the fourth part of a hide, which was usually about 30 acres. See Hide.

Virgil or **VERGIL** (70-19 B.C.). Roman poet, whose full name was Publius Vergilius Maro. Born Oct. 15, 70 B.C., at Andes (mod. Pietole), near Mantua, the son of a small landowner, he was educated at Cremona, Milan, Naples, where he learned Greek, and Rome, where he studied rhetoric and philosophy. He then returned to his native place, but after the battle of Philippi in 42 his father's estate was made over to the veterans who had fought for Octavian against Brutus and Cassius.

On the advice of his friend, Asinius Pollio, Virgil journeyed to Rome, and made a personal appeal to Octavian. There is some obscurity as to the result, but, if Virgil did not finally recover his property, he received compensation in the form of an estate in Campania. His visits to Rome secured him the patronage of Maecenas, the friendship of Cornelius Gallus and other influential personages, and above all of Horace. Relieved from financial anxiety by the generosity of Maecenas, he was able to devote himself undisturbed to literary work. From 37 onwards his life was spent alternately in Rome and Naples. In 19 he visited Greece, but was obliged to abandon his tour owing to illness. He returned in the company of Augustus, whom he had met at Athens, but soon after



Viper's Bugloss.
Flower spike of
the British plant

reaching Brundisium he died, Sept. 21, and was buried near Naples.

Virgil lived in the respect of all classes, but disliked public praise. Horace pays tribute to his sincerity, piety, patriotism, and loyalty to friends. So conscientious was his workmanship that in his last illness he wanted to burn the unrevised *Aeneid*.

The poems universally recognized as the work of Virgil are: (1) Ten Eclogues (selections) or *Bucolics* (pastoral poems), written 42-37 B.C. Imitated from the idylls of Theocritus (*q.v.*), they lack the freshness and truthfulness to nature which characterise his



Virgil, Roman poet, from a bust in the Capitol, Rome

Siilian model, and some of them can hardly be called pastoral poems at all. (2) The *Georgics* (37-30), or *Treatise on Agriculture*, a didactic poem in four books, dedicated to Maecenas. Prompted by the *Works and Days* of Hesiod (*q.v.*), and the *Phaenomena* of Aratus, book 1 treats of tillage, 2 of the cultivation of trees, especially the vine, 3 of cattle breeding, 4 of bee-keeping. (3) The *Aeneid*, an epic poem in 12 books. Undertaken at the request of Augustus, it took Virgil 11 years to complete the rough draft, revision of which was prevented by his death. In this unfinished state it was bequeathed to his literary executors, Varius and Tucca, on condition that it should not be published, but Virgil's wishes were overruled by Augustus. Imitated from Homer—the first six books based on the *Odyssey*, the last six on the *Iliad*—its purpose was the glorification of the Julian house represented by Augustus, the reputed founder of which was Ascanius, the son of Aeneas. Although possessing less artistic merit than the *Georgics*, it was enthusiastically received, and took its place as the national epic.

Several shorter poems, *Culex* (the gnat), *Ciris* (the name of a bird), *Moretum* (the salad), *Copa* (the hostess), and *Catalepton* (14 small poems of varied contents), are usually printed with texts of Virgil, but it is doubtful if any of them are really his work, with the possible exception of the *Moretum*.

Like the works of Homer, those of Virgil soon became a popular schoolbook, and the subject of grammatical and antiquarian research. In imperial times they were used as a method of divination, the

so-called *sortes Vergilianae*. They were held in special regard by Christians, who found in the fourth eclogue a Messianic prophecy. During the Middle Ages a number of legends, probably originating in Naples, gathered round the name

of Virgil, who became transformed in popular belief into a magician and wonder-worker. See *Aeneas*; *Aeneid*; *Eclogue*; *Georgics*.

J. H. Freese

Bibliography. The best edition for the general student is that of J. Conington (rev. H. Nettleship), with English notes, 1881-83. Complete prose translation J. W. Mackail, 1904-15; of the *Aeneid*, J. Conington, 1872; complete verse translation, J. Dryden, 1772; of the *Aeneid*, W. Morris, 1876; J. Conington, rev. 1903; of the *Eclogues* and *Georgics*, R. C. Trevelyan, 1945. *Consult also* Virgil in the Middle Ages, D. Comparetti, 1895; Virgil, T. R. Glover, 5th ed. 1923; V. and His Meaning to the World of Today, J. W. Mackail, 1923; V.'s Mind at Work, R. W. Cruttwell, 1947.

Virgin. Term used for a woman who has not had sexual intercourse with a man. On this account it is a popular synonym for pure or untouched, *e.g.* virgin soil. In a special sense it is used for the Virgin Mother. See *Mary*.

Virginal. Name applied to the spinet and harpsichord in the 16th century, probably on account of its being the favourite instrument of ladies, whereas gentlemen preferred the lute. Queen Elizabeth was vain of her mastery over the virginal. See *Harpsichord*.

Virgin Birth. Term for the doctrine that Jesus Christ, alone of all the human race, was born of one human parent; that, by the miraculous conception of the Virgin Mary, no entail of birth-sin was passed on to Him, and that He was thus born perfect man. See *Immaculate Conception*.

Virginia. State of the U.S.A. Known as the Old Dominion, it is one of the 13 original states of the Union, and has a land area of 40,815 sq. m. The S.E. comprises part of the Dismal Swamp; in the W. the Allegheny Range and the Blue Ridge, a continuation of the Appalachian system, enclose the fertile valley of Virginia which is watered by the Shenandoah, James, and other rivers, and broken by many parallel

ridges. The central plain, Middle Virginia, a well watered expanse, is succeeded by the Piedmont country, an undulating region inclining towards the Blue Ridge. Chesapeake Bay, Hampton Roads, and the broad river estuaries contain excellent harbours. All the chief rivers—Potomac, Rapahannock, York, James, and Roanoke—follow an easterly or south-easterly course.

Agriculture is a leading industry, for in 1935 68 p.c. of the land was farmed, about half by negro tenant farmers. In 1945 there were 173,051 farms with an area of 16,358,072 acres, of which nearly a quarter was under crops—wheat, oats, maize, potatoes, and apples. Soil erosion having threatened to exhaust tobacco lands, in 1937 400,000 acres were marked for reclamation by cooperative farming. Such progressive measures in Virginia are usually federal projects. The tobacco crop amounted to 167,000,000 lb. in 1946, when the cotton crop covered 20,000 acres. National forests, over four million acres, yield an abundance of timber. Coal, granite, limestone, iron ore, and slate are worked, and there are valuable oyster fisheries. The total rly. mileage exceeds 4,000, and there are some 80 airports.

Richmond is the capital and biggest city, followed by Norfolk and Roanoke. Two senators and nine representatives are sent to congress. Negroes, forming about a third of the est. pop. of 3,019,000, are virtually disfranchised by the imposition of literacy and property qualifications. Standards in education and public health are comparatively low. The leading political issue is the poll tax; this amounts to only 1½ dollars a year, but as payment is set well in advance of voting, people often forget to pay; moreover the tax is cumulative. Many Virginian laws are backward; *e.g.* convicts may still be shackled and flogged.

Named after the popular appellation for Queen Elizabeth, Virginia was the first permanent settlement in America. In 1606 James I granted a charter for the planting of colonies in Virginia; Jamestown was founded in 1607, and the colony was soon organized under a governor and council. A representative house of burgesses was set up, and this system remained until 1776. Troubles with the Indians were frequent, as were disputes between social classes and religious parties, but the colony grew in population and wealth

by its tobacco industry. The planters, importing slaves for their plantations, became rich, and Virginia had a culture of its own. Its citizens, among them Washington, joined heartily in the struggle for independence. During the Civil War this was one of the seceding states, a course objected to by the western area, which set up a separate government and was admitted to the Union as West Virginia in 1863. Thackeray's tale, *The Virginians*, is reckoned a masterly reconstruction of the old colonial life by one who had never been in the country. Consult *Virginia: The Old Dominion*, M. P. Andrews, 1937.

Virginia. Largest municipality in the ironfields of Minnesota, U.S.A. The co. seat of St. Louis co., it is 77 m. N. by W. of Duluth, and is served by rlys. Education is heavily endowed by a tax on mining properties. The place engages in iron mining, manufacture of machinery, lumbering, and flour milling. Finns and Swedes are largely represented in a pop. of 12,264.

Virginia. Heroine of ancient Roman legend. Daughter of the centurion Lucius Virginius, her beauty inflamed the decemvir Appius Claudius with desire to gain possession of her. He suborned one of his supporters to claim her as his slave, and when the case came before him in his judicial capacity, declared her to be the man's property. Thereupon her father, to save Virginia from dishonour, seized a knife from a butcher's stall and plunged it in his daughter's breast. A popular revolution broke out against the tyrannical decemvirs, the old magistracies were restored, and Appius Claudius, while awaiting trial, committed suicide. The story is the subject of one of Macaulay's *Lays of Ancient Rome*.

Virginia Creeper (*Parthenocissus quinquefolia*). Climbing shrub of the family Vitaceae, a native of N. America. It has large digitate leaves and inconspicuous green flowers much like those of the

grape vine. It climbs with the aid of branching tendrils, the branches ending in adhesive disks which cling to brick or woodwork. Veitch's creeper (*P. tricuspidata*), with small glossy leaves and short leafstalks, is a native of Japan. Both species are remarkable for their foliage, which assumes glowing red autumnal tints. See *Vine*.

Virginian Deer (*Odocoileus virginianus*). Species of deer. Found in Canada, the U.S.A., and in parts of S. America, it is about 3 ft. high at the shoulder, and the coat is reddish brown in summer, slaty blue in autumn, and greyish in the winter. The antlers are comparatively large and well branched, and the bushy white tail, held erect when the animal is running, is characteristic. Shy and wary, this deer runs with great speed.

Virginians, THE. Novel by Thackeray, published originally in monthly parts, 1857-59. It tells the fortunes of two of Henry Esmond's grandsons who, born in Virginia, took opposite sides in the American War of Independence. As a literary presentation of a past period, it is perhaps less successful than Esmond (*q.v.*), to which it is in some sort a sequel.

Virginian Stock (*Malcolmia maritima*). Annual herb of the family Cruciferae. A native of the Mediterranean region, it was introduced to British gardens in 1713. It has erect, branching stems, 6-12 ins. in height, with alternate elliptical leaves and bright flowers ranging in tint from white to rose. It is a favourite edging plant in gardens, but

frequently becomes weedy owing to overcrowding of the plants. To obtain the best results seeds should be sown thinly on poor soil in autumn, and the seedlings transplanted in March where they are to flower, 4 ins. apart. They then form dwarf, bushy plants and have a longer flowering period.

Virginia Water. Artificial lake in Windsor Great Park, on the borders of Surrey and Berks, England. About a mile from Virginia Water rly. station, it is



Virginia Water, Windsor. Corinthian colonnade, brought from Tripoli by George IV

1½ m. long and about ½ m. across at its widest part, the surroundings having been much beautified by time since the original marshland was drained and the lake created in 1746 by the duke of Cumberland with the aid of Paul Sandby. Notable features are the cascade, cavern, Fort Belvedere, commanding a fine view of Windsor Castle, temples, and a colonnade brought by George IV from the ruins of Leptis Magna, in Tripoli. Near by are the Holloway Sanatorium, 1874-76, and Christ Church, 1838. Virginia Water was drained for security reasons during the Second Great War. In 1948 it was announced that bathing would be permitted in the lake.

Virginibus Puerisque (*Lat.*, for girls and boys). Volume of essays by R. L. Stevenson. Published together in 1881, most of the essays had previously appeared in *The Cornhill Magazine*. They include *An Apology for Idlers*, *Ordered South*, and *El Dorado*.

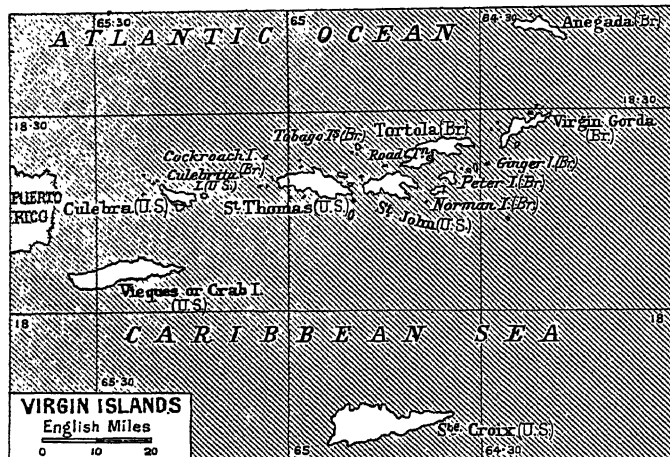
Virgin Islands. Group of the Leeward Islands, West Indies. It consists of more than 100 islands, all mountainous. The larger islands are Anegada, Virgin Gorda, and Tortola, belonging to Great Britain; and Crab or Vieques, Culebra, St. Thomas, Ste. Croix, and St. John, belonging to the U.S.A. Crab and Culebra were ceded to the U.S.A. by Spain in 1898, and the remainder of the American



Virginia Creeper. Hanging sprays of leaves



Virginian Stock. Leaves and cruciform flowers of this edging plant



Virgin Islands. Map of the group of British and American West Indian islands

group were purchased from Denmark in 1917 for £5,000,000. They cover 132 sq. m., with an est. pop. of 22,012. Bay oil comes from St. Thomas, bay rum from St. John, cattle and sugar-cane from St. Croix.

The British Virgin Islands form the E. extremity of the Greater Antilles. They have an area of 67 sq. m. and a pop. of 6,508. Vegetables, fruit, and charcoal are produced, cattle and poultry reared, and there are extensive fisheries. The bulk of the inhabitants are negroes. Road Town, on Tortola, is the British capital and port of entry. The Virgins were discovered by Christopher Columbus in 1494. The first British settlement was made on the island of Tortola in 1666.

Virgo (Lat., the virgin). Sixth sign of the Zodiac. It is one of the constellations known to the ancients. Gamma Virginis is a celebrated double star. Alpha Virginis is the star Spica, a double star of the first magnitude. The constellation is partly in a great nebulous region, and itself contains the spiral nebula Messier 99. *See* Constellation.

Viriathus (2nd cent. B.C.). Lusitanian herdsman who headed a revolt against the Roman rule in Spain. He defeated one Roman army after another, and in 141 the proconsul was forced to conclude a peace with him. Unbeaten in the field, he was eventually slain by assassins.

Viridian (Lat. *viridis*, green). One of the stable green pigments, it is the emerald oxide of chromium and is made by heating to dull redness three parts of boric acid together with one part of potassium bichromate.

Viroconium. Another form of the name of a Roman British town considered in this Encyclopedia under Uriconium.

Virtanen, ARTTURI ILMARI (b. 1895). Finnish biochemist. Born Jan. 15, 1895, at Helsinki, he was the son of an engine-driver, and went to a Viipuri public school and the universities of Helsinki, Zürich, Münster, and Stockholm. Having worked in an industrial laboratory and as chemist to the government butter control, from 1924 he taught organic chemistry at Helsinki, where in 1931 he was given charge of the chemical research laboratory and the chair of biochemistry at the technical university, and in 1939 made professor of the same subject at the university proper. Virtanen studied the biochemistry of bacteria, symbiotic nitrogen fixation, and the effect of micro-organisms upon the quality of food. He was awarded the Nobel prize for chemistry in 1945. His best-known book was *Cattle Fodder and Human Nutrition*, 1938.

Virton. Town of Belgium, in the prov. of Luxembourg. It is in the extreme S.W. close to the French border, 8 m. N.E. of Montmédy. The name of Virton is given to a battle in the First Great War fought Aug. 21-25, 1914, between the French and the Germans. It was intended by the French to be an advance on a front of 60 m. from the frontier between the Meuse and German Lorraine, but German strength was badly underestimated, and the result of almost every contact was a French defeat and withdrawal, with heavy losses.

Virus (Lat., poison). Term applied to minute agents which

cause disease in plants and animals. They are invisible under the ordinary microscope, but some have been photographed under the ultramicroscope and the electron microscope. Viruses can be transmitted from one organism to another and multiply in the diseased cells. This suggests that they are living organisms, a view which is supported by their variability, susceptibility to chemical agents such as alcohol and to relatively low temps. That they may not be organisms is perhaps indicated by their extremely small size and very rapid rate of increase, and by the knowledge that some may remain dormant for years in dried material. Some viruses pass through filters which ordinarily remove bacteria.

Among animal diseases resulting from their presence are infectious anaemia of horses; poxes of the fowl, sheep, goat, and pig; foot-and-mouth disease; dog distemper; and cattle plague. Human diseases due to viruses include measles, mumps, chicken-pox, small-pox, yellow fever, herpes, infantile paralysis, and the common cold. Diseased plants may exhibit various symptoms such as mottling of foliage (mosaic), streaks in stems or leaves, chlorosis, crinkling of foliage, wilts, and necrosis of tissues. Many viruses are known to be transmitted by sucking insects such as fleas, lice, mosquitoes, aphids, and thrips. Often it has been shown that only one species of insect will serve for a particular virus. In the body of the insect this may multiply and persist for a considerable period.

Vis. Yugoslav name of the island described in this work under its Italian name Lissa.

Visa (Lat. *visa*, seen). Official endorsement on a passport by the representative of the country to which the intending traveller is going. *See* Passport.

Wisby. Alternative spelling of the Swedish seaport Wisby (*q.v.*).

Viscacha (*Lagostomus*). Genus of small rodents. They belong to the chinchilla group, which occurs



Viscacha. Small nocturnal rodent of South America, allied to the chinchilla

W. S. Berridge, F.Z.S.

in S. America. The animal is about 20 ins. long, and has grey fur mottled with black on the upper parts and white beneath, and black-and-white stripes on the face. It is found in warrens usually containing about two dozen individuals, is nocturnal in habit, and feeds upon grass and roots.

Visceroptosis. Dropping of the abdominal organs due to weakness of the abdominal and pelvic muscles. Discomfort, flatulence, spasm, constipation, diarrhoea, are all possible results, because of interference with the functions of the various organs. Relief lies in the wearing of a specially-fitted, firm belt which maintains the organs in place; massage and exercises are given.

Vischer, PETER (1455-1529). German sculptor. Born at Nuremberg, he was the son of Hermann Vischer, a master brassworker, and studied in Italy. His most famous work was the monument of S. Sebald in the church of that name at Nuremberg; it occupied him 13 years (1506-19), and he was assisted by five sons. The tomb of Archbishop Ernest at Magdeburg, 1497, may also be cited. The outstanding sculptor in bronze of his time, Vischer died Jan. 7, 1529, at Nuremberg.

Visconti. Name of a noble Lombard family, lords of Milan, 1277-1447. Apart from a Crusader named Ottone, who was at Milan in 1078, the first member of importance was Ottone Visconti (*q.v.*), archbishop of Milan in 1262. His career was stormy, and after his death in 1295 the temporal power was assumed by his grand-nephew Matteo (1255-1322), who was appointed vicar of Lombardy in 1310, with extensive power in N. Italy. Involved in a quarrel with the pope, shortly before his death he abdicated in favour of his son Galeazzo (1277-1328), who married Beatrice d'Este, and was succeeded by his son Azzo (1302-39). In 1349 the lordship of Milan passed to Galeazzo's brother Giovanni, archbishop of Milan, and a patron of learning and letters. On the latter's death in 1354 his territory was divided between three nephews Matteo, Galeazzo, and Bernabo. The next ruler of importance was Giangaleazzo (*v.i.*), and after him the family dwindled in importance until the male line expired in the person of his son Filippo Maria (1391-1447), who was succeeded by his son-in-law Francesco Sforza.

Visconti, GIANGALEAZZO (*c.* 1347-1402). Duke of Milan. On the

death in 1378 of his father, Galeazzo II, he shared the government with his uncle Bernabo, whom he deposed and murdered in 1385. A type of the strongest and best of the Italian despots, his reign was marked by advancement and prosperity. Art and letters flourished under his rule. Milan cathedral, the Certosa and other buildings at Pavia, and the university of Piacenza, are lasting monuments to his greatness. He extended his rule to Verona, 1387; Padua, 1388; and as far as Florence, 1399-1401. In 1395 he induced the emperor Wenceslaus to recognize him as an independent sovereign with the title of duke. He died of the plague during the siege of Florence, Sept. 3, 1402.

Visconti, OTTONE (1215-95). Italian prelate. Canon of Desio, he was a protégé of Urban IV, who in 1262 nominated him archbishop of Milan. Unable to enter into his see until fifteen years later, owing to the hostility of the Della Torre family, who were all-powerful in the city, in 1277 Ottone seized their stronghold, imprisoned six of the Della Torre in iron cages, and took possession of his spiritual cure.

Visconti - Venosta, EMILIO, MARQUIS (1829-1914). An Italian statesman. Born at Milan, Jan. 22,



E. Visconti-Venosta, Italian statesman

1829, he was one of Mazzini's most active followers until 1853, when he realized that the salvation of Italy lay rather with Cavour than with the republican party. In 1859 he was nominated royal commissioner with Garibaldi's army, and the following year became adviser to Farini in Modena, Parma, and Naples. Five times foreign minister between 1863 and 1901, his terms of office were marked by wisdom and tact, especially during the difficult situations created by the war with Austria, 1866, the Franco-Prussian War, 1870, the occupation of Rome the same year, and the Abyssinian disaster of 1896. He died in Rome, Nov. 28, 1914.

Viscose. Synthetic fibre of cellulose from which a type of artificial silk is spun. It is a viscous solution of cellulose xanthate; which is derived from cellulose, chiefly purified wood pulp, mixed with cotton linters, caustic soda, and carbon disulphide. Viscose was first made in 1892 and the

basis of the commercial processes was established at Kew in 1898. In 1905 the manufacture of viscose artificial silk or rayon was begun at Coventry by Courtauld's. The process of manufacture is described under Rayon.

Viscosity (Lat. *viscus*, bird-lime). Internal friction, or resistance, to the motion of molecules of a fluid body among themselves. If a liquid flows over a horizontal surface, the layer of liquid next to the surface tends to adhere to it by cohesion, and the velocity of the fluid particles above this layer becomes greater the more distant they are from the bottom. Different liquids have different degrees or coefficients of viscosity, and these may vary at different temperatures. The property has the natural effect of destroying wave motion. Highly viscous liquids are tar and treacle; highly mobile, water and ether. The viscosity of a liquid decreases with temp., whereas that of a gas increases. The unit of measurement is the poise; water has a viscosity of approximately a centipoise, *i.e.* 10^{-2} poise, at 20° C. Instruments for measuring the viscosity of a fluid are called viscometers. In magnetism the term viscosity is used to imply the lagging behind of the attainment of the full value of the intensity of magnetisation after the magnetising force has been applied.

Viscount (Lat. *vicecomes*). Title of nobility. In the British peerage it ranks fourth, being below earl and above baron. The feminine is viscountess. A viscount's children enjoy the honorary prefix Hon. The title came to England from France, where the vicomte was at first simply the deputy of the comte or count. The first creation in England dates from 1446. Oldest existing viscounties are, in Ireland, that of Gormanston (1478), and, in England, that of Hereford (1550). A retiring Speaker is usually created a viscount.

Visé. Town of Belgium, in the prov. of Liège. It lies on the right bank of the Meuse, 10 m. by rly. N.N.E. of Liège. The town was destroyed by German troops in the First Great War, Aug. 14-15, 1914. Visé was fortified in 1334, and dismantled by the French in 1675.

Vishinsky In this Encyclopedia the spelling Vyshinsky (*q.v.*) is preferred for the name of this Russian politician.

Vishne-Volochek. Town of the R.S.F.S.R. It lies in the govt., and 70 m. N.W., of Kalinin, on the

Tsna, and the canal connecting it with the Tvertsa and the Lenin-grad-Moscow rly. This is the centre of the obsolete Vishne-Volochek canal system, which unites the Neva with the Volga. The chief industry is cotton spinning. Pop. 63,642.

Vishnu (Skt., worker). One of the three chief gods of Hinduism. Originally of minor importance, and perhaps a sun-god, he came to be regarded by his worshippers as the supreme deity, and hence was associated with Brahma and Siwa in the Trimurti or triad, in which his character was that of the preserver. He is the genial, kindly patron of the prosperous classes, and his rites, though often licentious, are free from bloodshed. Vishnu is represented as a man, painted black, with four arms, riding on the Garuda, half-man and half-bird. See Hinduism; Consult also Religions of India, E. W. Hopkins, 1895; Vedic Mythology, A. A. Macdonell, 1897.

Visibility. Term used to describe the transparency of the atmosphere: it is expressed by the maximum distance at which objects such as trees and buildings can be distinguished in daylight. As so defined, visibility is strictly not a direct measure of atmospheric transparency, i.e. the proportion of light transmitted through unit distance of the atmosphere. For the same degree of the latter the distance of visibility may vary between rather wide limits, but observations of visibility have the practical advantages over those of transparency that reasonably good estimates can be made without the use of instrumental equipment or special techniques.

Visibility depends upon the amounts of solid and liquid particles in the lower atmosphere, present as smoke, dust, water droplets, etc., and to a lesser extent upon the distribution of temp. and humidity along the path viewed. As a rule, the surface layers of the atmosphere are clearest when the air stream is of polar origin, although marked improvements can occur locally after heavy rain showers, because these wash some of the pollution out of the air. Smoke haze, carried by the wind from industrial areas, may form stratified layers at definite heights, thus rendering objects on the ground invisible from above.

During the daytime the scattering of light by molecules and nuclei increases the apparent

brightness of a distant object, e.g. on an overcast day objects viewed not far from the observer appear almost black in colour while those at greater distances are grey, the tone becoming lighter with increasing length of the path containing the light scattering sources. Hence visibility is largely a question of contrast, an object disappearing when its brightness becomes imperceptibly different from that of its background. Differences of form and colour are also important; with decreasing intensity of illumination red fades first, then green, etc., until a uniform grey is seen. The human eye is sensitive to light waves ranging from about 40μ to 75μ (i.e. $\frac{1}{10}$ to $\frac{1}{2}$ of a thousandth part of a millimetre) and is capable of detecting several hundred different colours. The faculty for distinguishing objects therefore depends partly upon the nature of the object and partly upon the observer's eyesight.

The international scale of visibility is given in the table below. At most meteorological stations a number of fixed objects or landmarks are selected as nearly as possible at the standard distances from the station, the objects either showing against the skyline or distinctly in contrast with their backgrounds, considerations of size being taken into account. The visibility on any occasion is then expressed by the code number of the most distant object of the series which can be recognized for what it is, i.e. a tree must show up as a tree, not merely as a vague shape.

Code Number	Object visible		Meteorological Description
	at	but not at	
0	—	55 yds.	Dense Fog
1	55 yds.	220 "	Thick Fog
2	220 "	550 "	Fog
3	550 "	1,100 "	Moderate Fog
4	1,100 "	$1\frac{1}{2}$ m.	Mist or Haze
5	$1\frac{1}{2}$ m.	2 $\frac{1}{2}$ "	Poor Visibility
6	2 $\frac{1}{2}$ "	6 $\frac{1}{2}$ "	Moderate Visibility
7	6 $\frac{1}{2}$ "	12 $\frac{1}{2}$ "	Good Visibility
8	12 $\frac{1}{2}$ "	31 "	V. Good Visibility
9	31 "	—	Excellent Visibility
	or more		

In Great Britain this international scale has been modified to include additional objects at 27 and 110 yards and $4\frac{1}{2}$ m. and $18\frac{3}{4}$ m., thus subdividing the range covered by numbers 0, 1, 6, and 8. Despite this, the spacing out of the visibility objects increases with the distance, and during the Second Great War it was found necessary in the British and dominions

meteorological services to introduce a supplementary scale.

In the British Isles throughout the year as a whole the best visibilities are reported on the N.W. coasts, e.g. at Blacksod Point on winter mornings and evenings visibilities below code figure 5 are seldom reported, there is little diurnal or seasonal variation, and the maximum of the curves is at visibility 7. On summer afternoons and evenings at such inland stations as Dalwhinnie and Armagh code figure 8 is the most frequently reported value. At most other times, seasons, and localities (e.g. winter mornings at Kew observatory), sea or land fog, with high humidity, causes a second maximum in the curves, generally at visibility 1.

Difficulty is experienced in judging visibility at night, and as far as possible the scale is used to denote the same degrees of atmospheric obscurity as in daylight observations. In practice the observer attempts to say how far he could see if it were daylight and the air equally clear. A series of lights at known distances is sometimes used to assist in the making of estimates, but again the visibility depends upon the light intensity and the darkness of the background. Instrumental aids include a visibility meter which makes use of the fact that the brightness of a fixed light at a fixed distance depends upon the transparency of the atmosphere, and can be measured by the density of a superimposed obscuring screen or filter which is just sufficient to reduce it to the limit of

visibility; in another type the electric current produced by the light from a fixed source falling upon a photo-electric cell is related to the visibility scale. See Condensation; Fog; Light; Pollution; Vision; Consult also Meteorological Observer's Handbook, H.M.S.O., 1942; V. in Meteorology, W. E. K. Middleton, 1941.

A. J. Drummond, F.R.Met.S.

Visigoths or **WEST GOTHS**. Branch of the Gothic people which in the 3rd century A.D. lived W. of the river Prut. It separated from the Ostrogoths about 250, and at that time occupied a region approximately corresponding to the modern Rumania. The later history of the Visigoths, which closed with the overthrow of their Spanish kingdom by the Mahomedans in 711, forms part of that of the Goths (*q.v.*).

Vision. Act or sense of seeing. The mechanical aspect of vision is dealt with under the articles Eye, Sight Testing, and various defects of sight, *e.g.* astigmatism. The duration of any stimulus necessary to produce a visual sensation may be exceedingly short, and depends upon the intensity of the exciting source. An image persists for some time after the stimulus has been removed.

Colour vision presents many difficulties of explanation. By the Young - Helmholtz theory, there exist in the visual apparatus three sets of nerve fibres, a red, a green, and a blue or violet set. Each separately excited gives a sensation of red, green, or blue, and any other colours are obtained by suitable mixing, each set of fibres being more or less excited by the particular kind of light wave falling upon the eye. According to Hering's theory different light rays produce certain definite chemical changes, which stimulate the fibres in a distinctive way.

Among animals the response to light stimulus is widespread, though varying greatly from that of man. Many animals, *e.g.* the earthworm, which are eyeless, respond to light through the skin, and many are usually insensitive to red. Birds have as wide a range of colour vision as man, and fish respond most readily to green and yellow light.

The complex organic compound formed in the retina of the eye, enabling the latter to be more sensitive in dim light, is known as the visual purple. This compound is supposed to be formed with the aid of vitamin A. The minimum amount of light energy required to stimulate the eye is governed by the quantum properties of light. Each eye has a separate chance of collecting the required number of quanta; it has been argued therefore (and is approximately verified) that two eyes are better than one on a dark night. *See* Colour; Retina.

Vision. In occultism, term applied to things seen otherwise than

by normal sight. It includes hallucinations and phantasms of both the living and the dead. *See* Psychological Research; Spiritualism.

Visitation. Ecclesiastical term for the office of inquiry performed at intervals by bishops and archdeacons in dioceses and parish churches. The episcopal inquiry is made concerning the state of religion in the diocese, and the office includes the administration of confirmation and the delivery of an address which is called a charge. Archidiaconal visitations are directed more particularly to temporal matters, *e.g.* the repair of churches, etc. In England diocesan visitation was instituted by Grosseteste (1175-1253).

Visitation, ORDER OF THE. R.C. religious order for women. Founded by S. Francis de Sales and S. Jane Frances de Chantal, in 1610, at Annecy in Savoy, it was designed for the care of the sick and the relief of the poor; but is now a strictly enclosed order of nuns devoted to a life of contemplation. The Sisters of the Visitation are a separate congregation, supposed to have originated at Ghent about 1600. They conduct schools, workrooms for girls, and homes for the aged poor.

Visitation of the Blessed Virgin Mary. Feast instituted by Pope Urban VI in 1389 in commemoration of the visit paid by the Blessed Virgin to her kinswoman Elizabeth (Luke 1). In 1441 the council of Basel directed that it should be observed in all Christian churches. In the Church of England calendar it is fixed for observance on July 2. *See* Magnificat; Mary.

Visiting Card. Small strip of pasteboard inscribed with the owner's name and station, his ordinary address being generally added. Visiting cards possibly originated in the East. In ancient Egypt tablets of glazed ware depicting the owner were left when visiting temples. Visiting cards appear to have been used in Germany in the 16th century. In France they came into general use in the reign of Louis XIV. England adopted them later apparently from France. In the 19th century in England there was an elaborate etiquette about the styles, sizes, and functions of visiting cards as symbols of correct social behaviour; but this dropped out of knowledge in the 20th century, and in the Second Great War the printing of private cards (as distinct from the business card), was prohibited.

Visp or **VISPACH** (Fr. Viège). Village of Switzerland, in canton Valais. It stands on the river Visp near its confluence with the Rhône, 54 m. by the Simplon rly. E. of St. Maurice. Starting point of the rly. to Zermatt.

Visscher, **ROEMER PIETERSEN** (1547-1620). Dutch poet. This wealthy burgher of Amsterdam devoted himself to letters, and with Spieghel and Coornhert advanced Renaissance culture and purified the Dutch language. His house was the centre of the most important literary salon in N. Europe, and his beautiful and accomplished daughters, Anna (1584-1651) and Marie Tesselschade (1594-1649), were distinguished poets. Tesselschade translated Tasso, and in her poem *Songsters* rivalled the best poets of the day, including her intimate friends Vondel, Hooft, Brederoo, and Huygens.

Vistula. River of Poland. The largest river flowing into the Baltic, it rises in the Beskids, North Carpathians, 20 m. S.E. of Teschen and flows N., then N.E. past Cracow, forming the N. boundary of Galicia, turns N. again past Warsaw, Plock, and Torun, and enters the Baltic by several mouths at Danzig (Gdansk) after a course of 630 m. Its chief affluents are the San, Bug, and Pilica. *See* Poland; Russo-German Campaigns.

Vital Statistics. Statistics relating primarily to the births, deaths, and marriages in a community. Such statistics are kept by all civilized peoples and have been developed so as to embody a great deal of knowledge of many kinds. In successive tables the figures are worked out in relation to various geographical subdivisions of the community; to groups of persons at various ages; to occupations; to causes of death, etc. They are valued by medical officers of health, and others concerned with the health of the community, for many reasons, *e.g.* as a means of testing the death rates from any particular disease among any section engaged in any particular occupation, or at any given age. *See* Birth Rate; Death Rate; Population; Statistics.

Vitamin. Word used to denote one of a group of essential nutrients that have nothing in common except the fact that most of them are present at relatively low concentrations in foods, either animal or vegetable, or both, and that each of them is necessary for the normal health of one species of animal or of several. In certain

instances the essential nature of this requirement is a matter of inference rather than fact, but there is no question about what happens when men, domestic animals, and certain smaller laboratory species are deprived of some of the best known vitamins. The word vitamin, originally spelt with a terminal e, was coined by the distinguished Polish scientist Casimir Funk when it was thought likely that only one such substance existed and that it was chemically an amine. It was soon found that there were at least two, and the family increased rapidly; J. C. (Sir Jack) Drummond suggested dropping the terminal e when some vitamins were clearly shown not to be amines. The word then replaced the phrase "accessory food factors," which had been introduced by Gowland Hopkins to describe the substance or group of substances shown by him to be present in milk and other foods and to be necessary for normal growth and health of laboratory rats. Hopkins strongly hinted that these substances would be found to be generally essential to animal life.

The vitamins can conveniently be divided into three groups representing their importance, or knowledge of their importance, to human health: (1) Vitamins in whose absence clear-cut deficiency diseases or conditions arise and can be recognized. Thus absence of vitamin D leads to rickets, of vitamin C (ascorbic acid) to scurvy, of vitamin B₁ (aneurine, thiamin) to beriberi, of nicotinic acid to pellagra, and of vitamin A to a characteristic group of symptoms which have no collective name, but include drying up and cornification of the mucous-secreting layers in certain organs (nose, trachea, intestinal tract, genito-urinary tract, etc.), and changes in vision ranging from loss of dark adaptation to night-blindness.

Of this group, vitamin D is known to exist as at least two different compounds, both of them equally active for man and the laboratory rat, but one of them almost inactive for chickens and other birds. The two vitamins D can best be regarded as vegetable and animal forms, the latter being utilised by birds as well as by mammals, the former not. Both occur naturally and both can be manufactured from pro-vitamins in the laboratory, by irradiation with ultra-violet light, a process that is also responsible in nature for the protection of children and

young animals against rickets when they are exposed to a bright sun or the mercury vapour lamp.

Vitamin C is chemically related to the sugars; vitamin B₁ is a fairly complex substance containing sulphur in the molecule. These last two are somewhat unstable in the presence of alkali, but fairly resistant to heat and oxidation in acid solution, vitamin B₁ more so than vitamin C. Nicotinic acid is a simple pyridine derivative (having none of the properties of nicotine, which is a more complex substance), distributed fairly widely in the same foods as contain vitamin B₁, such as liver, yeast, whole grain cereals. Vitamin B₁ is present in unusually large amounts in the flesh of pigs.

(2) Vitamins in the absence of which it is known, or there is very good evidence for believing, that deficiency conditions arise, though they are not associated with the name of any particular disease and may not, if uncomplicated by other deficiencies, alone lead to death. These vitamins include riboflavine, a complex pigment present in the cells of most plants and animals and, like aneurine and nicotinic acid, associated with the intracellular mechanism for the breakdown of carbohydrates and the release of energy; and vitamin K, like vitamins A and D a fat-soluble substance, occurring in a rather limited range of foods and tissues, but essential to maintaining a normally clotting mechanism in the blood. There are some who are convinced that vitamin E, another fat-soluble vitamin, is necessary for normal fertility in both male and female animals, including man, and also for the control of complex chemical processes taking place during muscular action.

(3) Vitamins that have been shown to be essential for some species of animals, but for which it has not been possible so far to prove that man has requirements. They include vitamin B₆, a group of substances called pyridoxine, pyridoxal, and pyridoxamine, which are fairly simple pyridine derivatives, though different in chemical structure as in physiological action from nicotinic acid; pantothenic acid, a derivative of two short-chain fatty acids and now believed to be associated with enzyme reactions in the body; biotin, of which a deficiency has been produced in human volunteers, thus suggesting its essentiality to man; and folic acid, fairly complex in structure and involved in fundamental processes of blood

cell formation. It contains in its molecule a substance called para-aminobenzoic acid, which appears to be a vitamin in its own right.

Most of the substances enumerated are fairly stable and will resist the ordinary processes of cooking and food manufacture, preservation, and storage. The amount of them present in different foods varies very widely from one food to another and from one vitamin to another. In general it is true to say that the more physiologically active are present in smaller amounts. Vitamin C, for example, is present in orange juice to the extent of $\frac{1}{2}$ to 1 part per thousand. Vitamin D in summer milk, on the other hand, is present only to the extent of about 1 part in 4,000 million.

A. L. Bacharach

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Vitebsk. Town of White Russia S.S.R. The capital of a region of the same name, it stands on the Dvina and is a rly. junction for Leningrad, Riga, and Smolensk, 140 m. N.E. of Minsk. The town was known as early as the 10th century and formerly belonged to Lithuania, but was taken by the Russians in 1654, and finally annexed at the first partition of Poland. Pop. 167,424.

Taken by the Germans July 12, 1941, Vitebsk was made by them into an exceptionally strong defensive position, northernmost fortress of the "fatherland line" covering White Russia and the Baltic republics. It was outflanked on the N.W. by Yaremenco on Oct., 1943, but not until June 25, 1944, was it encircled when Bagramyan from the N. joined Chernyakhovsky from the S. Vitebsk fell to a joint assault next day after a heavy bombing by 700 Stormoviks; 6,000 German dead were found in the streets. The living retreated in such confusion that the principal bridges over the Dvina and the Luchesa were taken undamaged.

Vitellius, AULUS (A.D. 15-69). Roman emperor from Jan. 2 to Dec. 22, 69. He was born Sept. 24, 15. Vitellius was in command of the legions of Lower Germany when the news of Galba's accession reached him. His own troops and those of Upper Germany refused to acknowledge the new emperor, and

Vitellius was proclaimed emperor at Cologne. In the meantime Galba had given way to Otho, and it was



Aulus Vitellius,
Roman emperor

the latter's troops that the generals of Vitellius defeated at Bedriacum when they marched into Italy. Vitellius reached Rome and gave himself to gluttony;

during his brief reign he spent a huge sum on the pleasures of the table. But already the legions of Illyricum had declared for Vespasian as emperor. Advancing into Italy, they defeated the Vitellians in two battles, and put Vitellius to death Dec. 22, 69.

Viterbo. City of Italy, cap. of Viterbo prov. It is 54 m. by rly. N.N.W. of Rome, at the foot of Monte Cimino. With its well-preserved Lombard walls and numerous medieval buildings, it maintained until the Second Great War its ancient aspect, but the N. and E. sections of the wall were then destroyed. The Romanesque-Gothic cathedral of San Lorenzo and the church of San Francesco contain the tombs of popes; San Francesco, however, was shattered during Allied bombardments in the Second Great War. The Palazzo Municipale, 1264, had a museum of Etruscan antiquities, many of which were lost. The churches of Santa Maria della Salute and Sant' Angelo and the former church of Santa Maria della Verità, later a public hall, were of architectural interest, but were badly damaged. Many other noteworthy buildings were destroyed or heavily damaged in 1944, though attempts to rebuild were afterwards made. Near by are the warm sulphur springs and baths of Bulicame, and the pilgrimage church of S. Maria della Quercia. Leather, paper, soap, matches, and playing-cards are manufactured. Pop. 36,123.

Vitoria or **VICTORIA.** Seaport of Brazil, capital of the state of Espirito Santo. It is 300 m. by rly. N.E. of Rio de Janeiro on an island in the Bay of Espirito Santo, and

has a fortified harbour. Sugar, rice, coffee, and manioc are exported. The port has rly. connexions with Rio de Janeiro and Joanesia on the Rio Doce. Pop. est. 60,000.

Vitoria. City of Spain, capital of the Basque prov. of Alava. It lies among the spurs of the Cantabrian Mts., on the left bank of the Zadorra river, 30 m. direct S. of Bilbao. The upper or old town is gloomy, the new town at a lower level is more open. The cathedral of Santa Maria de Vitoria and the church of San Vicente are medieval fortress churches which have been restored. Chairs, iron bedsteads, woollens, crockery, chocolate, and chemicals are the principal products. In the 10th century the city was a fortress with extensive privileges. Here in 1813 Wellington defeated the French. Pop. 56,745.

VITORIA, BATTLE OF. Fought June 21, 1813, between the British and Portuguese under Wellington, and the French under Joseph



Viterbo, Italy. Cloisters of the church of S. Maria della Quercia, a resort of pilgrims from all parts of the country

Bonaparte and Jourdain. Wellington and Hill made a frontal attack, which was completely successful and cut off from the Vitoria-Bayonne road the French forces, who retreated in disorder towards Pampeluna, abandoning 14 guns and great quantities of stores and equipment. The battle was decisive in freeing the Spanish peninsula from French domination.

VITORIA, TOMAS LUIS DE (c. 1535-1611). Spanish composer. Born at Avila, he became choir-master, 1573, of the Collegium Germanicum at Rome, where his name was Latinised to Vitoria. During this period he was an intimate friend of Palestrina, whose influence on his work was marked. Vitoria wrote motets, masses, psalms, hymns, and magnificats, but his greatest work was a requiem, 1605, on the death of the empress Mary. From 1589 until his death, Aug. 27, 1611, he lived at Madrid. His music, which stands with the greatest of the polyphonic

style, was long almost completely neglected, but was rediscovered during the romantic revival of the 19th cent. A completed. was pub. by Breitkopf and Härtel in 1896.

Vitré. Town of France. In the dept. of Ille-et-Vilaine, it stands on the Vilaine, 25 m. by rly. E. of Rennes, and is a rly. junction. There are quarrying and tanning industries, an agricultural trade, and manufactures of woollens and agricultural implements. Vitré is remarkable for its 16th-17th century streets and houses, and the restored 14th-15th century château is a fine example of the feudal stronghold. The estates of Brittany met here in the 17th-18th centuries. Pop. est. 10,000.

Vitreosil. Name given to a translucent form of silica (SiO₂) prepared from sand. It has a low coefficient of expansion, and so is useful in laboratory apparatus liable to undergo large and sudden changes of temp.

Vitrified Fort (Lat. *vitrum*, glass; *facere*, to make). Ancient stronghold whose defensive walls of loose stones were more or less consolidated by fire. Best developed in Scotland, about 50 remain between the Moray Firth and Wigtownshire. Fusible stones from a distance were deposited upon larger local blocks left unburned; vitrified walls were often less than half the thickness of those in ordinary hill-forts. Similar structures were erected in W. France and Central Europe.

Vitrina. Genus of small snails, nearly related to the slugs. As the shell is very thin and transparent, the animals are often known as glass snails. They have the peculiarity of being about in the winter when other species are hibernating.



Vitrina fasciata, a typical species of the small glass snail

Two species occur in the U.K., *Vitrina pellucida*, common under damp, dead leaves nearly everywhere, and *V. pyrenaica*, known in a few localities in Ireland.

Vitriol. General term for many metal sulphates. Sulphate of iron is known as green vitriol, sulphate of copper as blue vitriol or vitriol of Venus, and sulphate of zinc as white vitriol. See Sulphuric Acid.

VITRUVIUS POLLIO, MARCUS. Roman architect and author of the 1st century B.C. A North Italian, he was probably employed by Julius Caesar as a military

engineer in the African war, 46 B.C., and worked as an architect under the patronage of Augustus, to whom he dedicated his work in ten books, *On Architecture*, about 16-13 B.C. The work of Vitruvius, practically the only surviving original authority on classical architecture, exercised enormous influence when the style was revived.

Vitry-le-François. Town of France. In the dept. of Marne, it stands on the river Marne, in the W. of the Perthois plain, 30 m. by rly. W. of Bar-le-Duc. The Marne-Rhine and Marne-Saône canals start here. Industries are concerned with chalk and cement, paper-making machinery, and malt, and there is trade in cereals, wood, and woollens. The church of Notre Dame was begun in 1629. Vitry takes its suffix from Francis I, who aided the townsfolk of Vitry-en-Perthois, destroyed by Charles V, to rebuild their town on this site, 1545. In German occupation from June, 1940, Vitry-le-François was entered Aug. 29, 1944, by the U.S. 3rd army after the Germans had withdrawn. Pop. 8,500.

Vittoria. Town of Italy, in the Sicilian prov. of Ragusa. Situated 45 m. direct and 95 m. by rly. W.S.W. of Syracuse, it has an extensive trade in locally produced wine. Its port, Scoglitti, lies 8 m. S.W. Nearby are the ruins of the ancient Camarina. Pop. approx. 32,000.

Vittoria. This Spanish city, and the battle fought there, are described as Vittoria.

Vittorio Veneto. Town of Italy, in the Venetian prov. of Treviso. It lies at the foot of the Venetian Alps, at the entrance to the valley of Santa Croce, 44 m. by rly. N. of Venice, and is a summer resort with saline and sulphur springs. It was formed in 1879 by the union of the towns of Ceneda and Serravalle, and is a bishopric. Silk manufacture is the main industry, and woollens, paper, cement, and lime are also produced. Vittorio figured prominently in the Italian campaigns of the First Great War, being captured by the Austrians on Nov. 7, 1917, and regained by the Italians on Oct. 30, 1918, in what is sometimes called the third battle of the Piave. Pop. 24,000.

Vitus. Christian martyr and saint of the 4th century. He is said to have been born in Sicily, of a noble family, and to have been converted to Christianity by his nurse, Crescentia. Enraged by this, his father handed the boy

over to Valerian, the governor, who tried in vain to change his faith. Vitus escaped to Italy, and was martyred either in Lucania or in Rome under the Diocletian persecution. He is the patron saint of dancers, and his name was formerly invoked against various complaints, notably chorea, which was known as S. Vitus's dance. Regarded as patron saint of Saxony, he has a festival on June 15.

Vivaldi, ANTONIO (d. 1743). Italian composer. Son of a violinist, he was born at Venice, and having entered the service of the landgrave of Hesse-Darmstadt (then resident in Italy), returned in 1713 to his native place, where he became director of concerts at the Ospedale della Pietà—a founding hospital for girls—until his death. A remarkable violinist, he wrote chiefly for that instrument, but in his love of bravura deviated from the classical style initiated by Corelli. Vivaldi's concertos displayed variety of form, and Bach arranged 16 of them for the clavier, four for the organ, and developed one into an extensive work for four claviers and a quartet of strings.

Vivandière (from Ital. *vivanda*, food). Woman attached to French or other Continental armies to sell provisions, etc. The dress was formerly a modification of the uniform of the unit to which she was attached.

Vivarini. Name of a family of Italian painters belonging to Murano, near Venice. Among the most notable was Antonio (c. 1420-70), the founder of the Muranese school. In his earlier work he was influenced by Gentile da Fabriano. The best period of his artistic career was that in which he was associated with a younger brother, Bartolommeo (c. 1423-99). No work by the latter is traceable before the great altar-piece of the Madonna and Child with Saints (Bologna museum), which was the joint production of the brothers. Bartolommeo is said to have been the first Venetian to use the new oil medium, though his most successful works are frescoes.

Alvise or Luigi Vivarini (c. 1446-c. 1502) was the son of Antonio, and probably the pupil of Bartolommeo, whose influence is visible in his early work. He was employed by the Venetian senate in the decoration of the great council chamber, and paintings by him are preserved in Venice and other Italian cities. All

the family are represented in the National Gallery.

Vives, JUAN LUIS (1492-1540). Spanish humanist. Born at Valencia, March 6, 1492, he was educated there and in Paris. In 1519 he was made professor at Louvain, and in 1523 he was in England, acting as tutor to Mary Tudor and lecturing at Oxford. The rest of his life was passed at Bruges, where he died May 6, 1540. A friend of More and Erasmus, Vives was one of the greatest scholars of his time. He wrote a number of books, chiefly philosophical, which in part anticipated Bacon's *Novum Organum*. Some have been translated into English, notably the *Introduction to Wyndome*, 1540.

Viviani, RENÉ (1863-1925). French statesman. Born in Algeria, Nov. 8, 1863, he entered the French chamber as a Socialist in 1893. After holding minor gov't. offices 1906-1913, he became prime minister shortly before the outbreak of the First Great War, but resigned in 1915, subsequently accepting office as minister of justice under Briand. After the war he became France's permanent representative at the League of Nations. He died Sept. 7, 1925.

Vivianite. In mineralogy, a hydrated iron phosphate. The mineral, usually associated with iron, copper, or tin ores, is blue to green in colour with a pearly lustre. Alternatively known as blue iron earth, it is named after J. H. Vivian, a mineralogist.

Vivien. Character. In Tennyson's *Idylls of the King*. Jealous of the fame of the Knights of the Round Table, she initiates ill rumours about them, vainly tries her blandishments on Arthur himself, and then cajoles the wizard Merlin, following him to Broceliande, where she learns his magic and, making him the victim of it, leaves him.

Vivisection (Lat. *vivus*, alive; *secare*, to cut). Operation on a living subject for the purpose of advancing science. The vast majority of experiments, however, which fall under the head of vivisection are not operations but inoculations, blood tests, feeding experiments, etc. Vivisection was first practised by Herophilus about 300 B.C., and for many years criminals were vivisected at Pisa. In the 19th century it was taken up on a much larger scale; Pasteur carried out elaborate experiments on sheep and other animals. The development of vivisection led to an agitation

against it, especially in Great Britain, and societies were founded to check it. Supporters of vivisection replied in 1908 by establishing the Research Defence Society. In 1906 a royal commission was appointed to inquire into the matter.

In the U.K. experiments on animals are restricted by the Act of 1876, which is administered by the Home secretary, with the assistance of a special advisory body.

In general the animal must be under an anaesthetic, but experiments may be performed without anaesthetics on a certificate by the president of certain scientific societies, e.g. the Royal College of Surgeons, that their use would defeat the object of the experiment. When experiments without anaesthetics are performed on dogs or cats it must also be certified that the object of the experiment will be frustrated if any other animal is substituted. On an average some 300,000 experiments are performed annually, a third of them relating to sera, vaccines, and drugs. See Anti-Vivisection.

Vizagapatam. Dist. and seaport of Madras state, India. The dist. is in the N.E. of the prov. on both sides of the E. Ghats. Rice and food grains are the chief crops; manganese is mined. The town, which is connected by a branch with the Madras-Calcutta main rly., is a noted centre for carving. The E. India co. had a factory here in the early 18th century, but in 1757 surrendered it to the French, who two years later were finally driven out. This is the only protected harbour on the Coromandel coast. Plans for enlarging it were actually drawn up in the days of the co., but not until 1925 was the project taken up. In 1933 the modernised harbour was opened for sea-going vessels and special rly. construction linked it with the Central Provinces for transport of manganese to the sea. A suburb of Vizagapatam is Waltair, standing on high red rocks above the sea. Dist. area 9,107 sq. m.; pop., 3,845,944; town, pop. 70,243.

Vizcaya. Spanish name for one of the three Basque provs. of Spain. See Biscay.

Vizeu or Viseu. Dist. of Portugal, in Beira Alta prov. It lies between the rivers Douro and Mondego. It is mountainous in the N. and W., and is watered by the rivers Vouga, Paiva, and Dão. Its area is 1,933 sq. m. Pop. 465,563.

Vizeu or Viseu. City of Portugal, capital of the dist. of the same name. It stands on the Asnos river,

31 m. N. of Dão, at an alt. of 1,770 ft., the terminus of a branch of the Figueira-Guarda rly. The church of São Miguel contains the tomb of Roderick, last king of the Visigoths. It is the seat of a bishopric. Pop. est. 10,000.

Vizianagram. Town of Madras state, India, in Vizagapatam dist. It is situated 40 m. N.E. of Vizagapatam, and its station links the Bombay-Calcutta with the Calcutta-Madras main rly., and is the junction for Parratipuram. Manganese is mined near. The maharaja of Vizianagram (b. Dec. 28, 1905) captained the Indian cricket team which toured England in 1936. Pop. 51,749.

Vizier (Arab. *vazir*, from *vazara*, to support). Oriental title held by the minister of the Abbasid caliphs. In Turkey, under the sultanate, the head of each department of the council was styled vizier, and the sultan's chief minister was known as the grand vizier. The title was held by the chief officer of the Mogul emperors.

V.J.-day. Name given to Aug. 15, 1945, day kept, with Aug. 16, as a public holiday in the U.K. to celebrate victory over Japan in the Second Great War. The Japanese minister in Switzerland had handed formal acceptance of the Allied terms of unconditional surrender to the Swiss foreign office at 8.10 p.m. on Aug. 14.

Vlaardingen. Town of the Netherlands, in the prov. of S. Holland. It lies on the Maas estuary, 6 m. by rly. W. of Rotterdam, and is a busy centre of the herring and other fisheries. Vlaardingen is one of the oldest towns in the country, and at one time was capital of the co. of Holland. Pop. 42,987.

Vlach or WALLACH. People of mixed stock, mostly in the Balkan peninsula. The name, applied by their neighbours, is sometimes considered a variant of Welsh, foreigner. Estimated at some 10,000,000,

they have called themselves Ruman, and apparently represent the Neolithic long-headed Balkan population, affected by pastoral nomads immigrant from the E., possibly by the Romanised Dacian stock, and by Greek and Slav infiltration.

Vladikavkaz. Former name of the Caucasian town of Orjonikidze, entered under the latter name.

Vladimir. Town of the R.S.F.S.R. and capital of the region of the same name. It stands on the Klyazma, 110 m. E.N.E. of Moscow. It is famous for its linen and cotton goods, and cherries. Founded in the 12th century, it became the chief seat of Russian rule, and united with Suzdal, the capital of the principality, which was afterwards absorbed by Moscow. The ancient cathedral of the Assumption contains rich treasures, tombs of bishops and princes, and many relics. The Golden Gate is a triumphal arch with a gilded dome erected in 1158 and restored in 1810. Pop. 66,761.

Vladivostok. City and harbour of the Far Eastern region of the R.S.F.S.R. It stands on the S. end of the Muraviev Peninsula, between the Amur and Ussuri bays. It is the terminus of the Trans-Siberian and Ussuri rlys. and is connected with Khabarovsk and the Manchurian system. The town was founded in 1860, and does a considerable trade, having also shipbuilding yards. There is a fine harbour, but an ice-breaker is required to keep open a channel for three months in the year. Its old name was Port May; Vladivostok means ruler of the east. It is the principal Pacific naval base of the U.S.S.R., and headquarters of the army of the Far East. There is a university here. Pop. 206,000.

During the Russo-Japanese War a Russian squadron was based on the port, but this was defeated by Kamimura, and took no further



Vladivostok. General view of the town and harbour of this city and Pacific naval base of S.E. Siberia, terminus of the Trans-Siberian railway

part. After the Russian revolution, 1917, and the formation of the Bolshevik government, Vladivostok became of great importance for the Allies as the only base for the Czechoslovak army, and it was occupied by British, Japanese, Americans, and Italians. After the Czechoslovaks had been withdrawn the Japanese remained for a time.

VlonĚ (Ital. Valona; Turk. Arlonya). Town and harbour of Albania. Anciently known as Aulon, it lies on the Adriatic, 60 m. S. of Durazzo. It has an excellent harbour, protected on the N.W. by the island of Sasseno, and on the S.W. by Cape Linguetto. It exports oil, wool, and tortoiseshell. It belonged to Turkey from 1464 until the Balkan Wars, and was the site of the declaration of independence by Albania, Nov. 28, 1912. In 1915 it was occupied by the Italians, who made it a naval and military base against the Austrians. Pop. est. 6,500.

Vltava (Ger. Moldau). River of Czechoslovakia, in Bohemia. It rises in the S. of the plateau in the Bohemian Forest, near the Austrian frontier, and flows 265 m. northwards to join the Elbe (Labe) at Melnik, passing Budejovice (Budweis), to which it is navigable, and Prague. Its tributaries are the Watawa and Berounka on the left, and Luschnitz and Sazava on the right; the valley drops in terraces from 2,500 ft. in the S. to below 400 ft. at Melnik. Between Prague and Budejovice the Vltava flows through a deep and narrow gorge; this limits the navigability of this section, which has been canalised. From Budejovice leads a canal to the Danube. Vltava is the title of the most frequently played of Smetana's. group of tone-poems, *Ma Vlast* (My Country).

Vocalion. A harmonium invented in the last quarter of the 19th century by James Baillie-Hamilton. Its broad free reeds were acted upon by high wind-pressure, and it possessed great purity and variety of tone, but notwithstanding its merits it never became a commercial success.

Vocative (Lat. *vocare*, to call). In grammar, the form of a word used in addressing a person or thing. In Indo-European, Greek, and Latin such forms were little used; in most modern European languages the nominative supplies their place. The vocative is not really a case.

Vodena. Town of Greece. It is in Macedonia and lies 41 m. S.E.

of Monastir (Bitolj). It has some manufactures, and carries on a trade in wine. Vodena is on the site of Edessa (q.v.), the earliest capital of Macedonia. Pop. 25,000.

Vodka. Russian alcoholic drink. A spirituous liquor, it is distilled from rye, barley, oats, potatoes, or maize. A crude, strong spirit, it contains up to 95 p.c. of alcohol, although for consumption this percentage is diluted down to 50 or thereabouts.

Vogel, HERMANN KARL (1841–1907). German astronomer. Born at Leipzig, April 3, 1841, and educated at Leipzig and Dresden, he became assistant at the Leipzig observatory in 1865. Observer at the astrophysical observatory at Potsdam, 1874, he was director by 1882, and in 1892 a member of the Berlin academy. Vogel carried out valuable astrophysical investigations, especially on the spectrographic determination of the radial motion of the stars, and published the first spectroscopic star catalogue, 1883. He died Aug. 13, 1907.

Voghera. Town of Italy, in the prov. of Pavia. It stands on the left bank of the Staffora, 18 m. by rly. S. of Pavia city. The fortifications constructed by the Visconti (q.v.) have been replaced by boulevards. There is a trade in wine, wheat, and silk. Pop. 21,000.

Vogler, GEORG JOSEPH (1749–1814). German musician. Born at Würzburg, June 15, 1749, he



Georg Vogler,
German musician

studied music and theology in Italy, and, ordained priest in Rome, 1773, was generally known as Abbé or Abt Vogler. His life was spent in almost continuous travel over Europe, with sojourns of some duration at Mannheim and at Stockholm, where he established music schools. He was royal kapellmeister at Stockholm, 1786–99. In 1790 he visited London to give organ recitals. In 1807 he became court kapellmeister at Darmstadt, where he opened another music school, Meyerbeer and Weber being among his pupils. He died there, May 6, 1814. Noted for performances on a type of organ of his own invention, Abt Vogler is made the speaker in a poem, Abt Vogler, by Browning.

Vogul. Nomadic people of Ugrian stock on the N. Ural slopes, W. Siberia. Only a few thousands, they are long-headed, and allied in

culture, speech, and shamanist belief to the Ostyak.

Voice (Lat. *vox*; Fr. *voix*; O. Fr. *vois*). Sound produced by the vibration of the vocal cords in the larynx by a current of air driven against them from the lungs. The tones of the voice are lower in men than in women and children, because of the greater length of their vocal cords. In the falsetto voice, part of the cords are held rigid, and only part allowed to vibrate. Loss of voice may be due to hysteria or paralysis of the larynx, or to cancer and other diseases of the vocal cords or adjacent structures. See Larynx; Speech.

Voice. In English grammar, forms of the verb expressing certain relations between the subject and the action of the verb. The active voice, in which the subject performs the action, is contrasted with the passive, in which it is the object or recipient of the action (he beats the boy; the boy is beaten).

Voicing. In organ building, the method of securing a desired quality of tone in an organ stop. The basic quality of flue pipes depends on their shape and scale, among other things, but the voicer is a skilled finisher, who by various means renders that quality more distinctive and more even throughout the compass. See Organ; Stop.

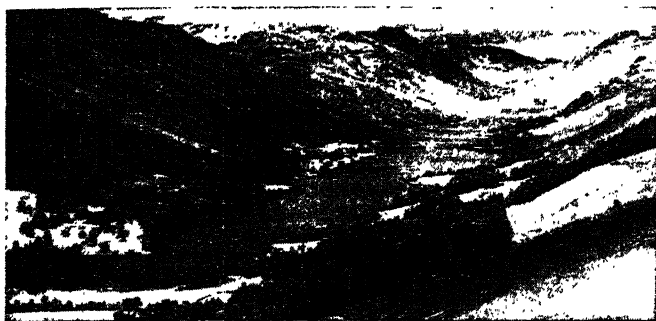
Void. Term used in English law to describe a contract or obligation that has, from the beginning, no legal force or effect. For example, a contract by an infant to repay borrowed money is void. A voidable contract, document, or obligation is one which can be declared void by one of the parties to it, on such grounds as fraud, or undue influence, or duress. Sometimes a voidable contract or transaction is ratified by silence for a long period.

Voigt, WILHELM. German impostor who called himself the captain of Köpenick (q.v.).

Voil, LOCH. Lake of Perthshire, Scotland. Situated in the parish of Balquhither, it lies 8 m. S. by W. of Killin, and over 400 ft. above sea level. Its maximum length is 3½ m.; it is linked with Loch Doine. See illus. in facing p.

Voile (Fr., *veil*). Fine, open-meshed fabric. Usually of cotton, though occasionally wool or silk, it is made from hard twisted yarn, and is either plain or printed in colours.

Voiron. Town of France, in the dept. of Isère. It stands on the left bank of the Morge, 17 m. by



Voil, Scotland. The picturesque Looh Voil situated in the Perthshire mountains, viewed from near Balquhider

ry. N.W. of Grenoble. It is noted for its fine linen and the high-grade paper made close by at Paviot, where the paper-making industry has been carried on since 1547; silk and liqueurs are also produced. Voiron was disputed by the episcopal sees of Vienne and Grenoble, later by the Viennois and Savoy, the latter granting a charter, c. 1266. It passed to France with Dauphiné in 1349. Pop. 12,598.

Voisin. Firm of French aeroplane builders. It built the first practicable aeroplane made in Europe, and that in which Henry Farman first flew. Voisin bombing biplanes were used throughout the First Great War by the French. In 1937 the plant became a unit of the French national aircraft industry, and during the German occupation of 1940-44 built training aircraft for the Luftwaffe.

Vojvodina. Autonomous prov. of Yugoslavia brought into being by the constitution of 1946. It lies in the N. of Serbia, towards the borders of Hungary and Rumania, being roughly coterminous with the Yugoslav part of the Banat. The city of Novi Sad is the capital. A regional parliament is elected for three years; there is a supreme court; and the various nationalities, including many Hungarians, may use and give instruction in their own languages. This territory was seized by Hungary after the Axis attack on Yugoslavia in 1941.

Volans (Lat., flying). Southern circumpolar constellation placed by Bayer below Carina, the keel of Argus. Known also as the Flying Fish, it contains no bright stars. See Constellation.

Volapük (corrupted from English *world-speak*). Name given to a system of universal language, invented in 1879 by J. M. Schleyer, a priest of Constance, Baden. The

alphabet consists of 26 letters, 8 long vowels, and 18 consonants. There is one declension and one conjugation, subject to no exceptions. Adjectives are derived from substantives. All words are accented on the last syllable. The vocabulary consists of some 15,000 words, mostly monosyllabic. About a third of the words are of English, a quarter of Latin or Romance, and a fifth of German origin. See Esperanto; Universal Language.

Volcano (Lat. *Volcanus*, god of fire). Vent in the earth's crust up which molten rock and gases escape from the earth's interior. Volcanoes may mark the top of a pipe or of a fissure. Often they occur in groups which show a regular alinement or pattern indicating location along a line of fracture, or at the intersections of two fracture systems. Present-day volcanoes are closely associated with recent earth movements and the younger mt. ranges of Tertiary or later age. The volcanoes which ring the Pacific Ocean and form the "circle of fire" are all connected with such ranges. Another area of recent movement and volcanism is that of the Rift Valley of E. Africa.

At depth the pressures are great, and gases are dissolved in the rock-melt (magma, *q.v.*). As the magma ascends the volcanic pipe hydrostatic pressure decreases and the gases come out of solution as bubbles. The melt, now partly robbed of its gases, is termed pyromagma, a hot active form of lava. The liberated gases are now capable of reacting chemically with each other and with oxidised old lava that has fallen back or land-slipped into the crater, and great heat is generated in the upper parts of the lava column or in the lava lake at the top. The violence of the eruption depends upon the relative ease with which the gases

escape from the lava column. Where the lava is fluid the gases can bubble away quietly, and the lava flows out, building broad, gently sloping, volcanic shields which form the greatest of modern volcanoes. *e.g.* Mauna Loa, Hawaii, which rises more than 28,000 ft. above the ocean floor on which it stands. Similar quiet outflows of lava occurred in Iceland at the Laki Fissure (*q.v.*); in N.W. Scotland; the Deccan, India; Snake River Plateau, U.S.A., and other areas, where the lava rose up numerous fissures and flooded the entire region. Volcanic eruption becomes less continuous and more violent with increasing viscosity of the melt in the volcanic conduit. This is not necessarily due to the effect of cooling of the melt, but is more probably the result of changes in chemical composition; silica-rich lavas are more viscous than basaltic ones. Hence certain types of volcanic eruption are recognized: (1) fissure and (2) Hawaiian, in which lava emission is relatively quiet; (3) Strombolian, in which gases explode at short, more or less regular, intervals, and throw out bombs of viscous lava; (4) Vulcanian, in which the explosions are more violent and at longer intervals; the lava in the crater has had time to solidify between outbursts, and solid blocks, ashes, and black clouds of dust are ejected; (5) Vesuvian, in which long periods of quiescence or mild eruption and lava outflow, during which gas pressure may build up, are followed by violent paroxysmal eruption: the escape of lava through cracks in the mt. side lowers the level of the column in the crater, and the hydrostatic pressure in the reservoir below is reduced; this allows the gases to come out of solution at depth, and the exploding lava froth is ejected, forming great luminous ash clouds; (6) Peléan, called after Mont Pelée, in which stiff viscous lava retains its gases, explodes as it escapes through cracks in the plug in the crater, and forms a *nuée ardente* (*q.v.*).

Explosive volcanic eruptions project into the upper layers of the atmosphere enormous quantities of dust in so fine a form that it may take more than a year to settle. It has been estimated that between 4 and 5 cu. m. of dust were thrown into the air from Krakatoa (*q.v.*) in 1883, the explosive wave carrying the dust $3\frac{1}{2}$ times round the earth, *i.e.* a distance of c. 26,000 m. This pre-

sence of volcanic dust causes a reduction in the intensity of the solar radiation received at the earth's surface; another effect is the production of brilliant sunsets and optical phenomena, e.g. Bishop's ring, due to diffraction of the light rays.

Several examples of the birth of new volcanoes are known, but none outside a pre-existing volcanic field. The Laki Fissure opened in 1783; Monte Nuovo, on the shores of the Bay of Naples, rose to a height of about 400 ft. in a few days in 1538, and then became inactive. Mt. Paricutin in Mexico was born on Feb. 20, 1943, and continued violently erupting ashes and lava.

The shapes of volcanoes depends upon the type of eruption and the nature of the material thrown out. Dome-like shield volcanoes are formed by fluid basaltic lava; conical volcanoes like Fujiyama in Japan are stratified, being built of alternating beds of ashes and lava flow. As the life of the volcano is prolonged, small parasitic cones develop on the mountain flanks, so destroying its symmetrical shape. Where there have been very violent eruptions with the discharge of pumice to such an extent that the magma chamber below the volcano has emptied itself, the whole volcanic edifice may collapse and a caldera (q.v.) be formed.

Once activity ceases erosion rapidly attacks volcanoes, and the unconsolidated ashes of the cone are washed away; but the congealed lava plug in the original conduit is hard and resistant, and so stands up as a hill or isolated craggy knob. Edinburgh Castle is built on such an ancient volcanic plug.

Volcanoes erupt not only on land, but also beneath the sea, and submarine lava flows have been observed. They often show pillow structure (see Pillow Lava). Volcanic products and lavas are often found interbedded with ancient sediments; and old volcanic plugs or necks testify that there were once periods of volcanic activity in areas which have since been tranquil for millions of years. In Great Britain the roots of huge volcanoes of Tertiary age are found in Skye, Rum, Ardsamurchan, Mull, and Arran. Ben Nevis, Glen Coe, parts of the midland valley of Scotland, and the Cheviots were volcanic areas during and after Old Red Sandstone times. The mts. of the Lake District and N. Wales are com-

posed chiefly of Ordovician lavas and ashes, and evidence of Pre-Cambrian volcanicity can be seen in the Malvern hills. The international union of geodesy and geophysics undertook in 1949 the compilation of a 1,500-page catalogue of the world's volcanoes. See separate entries on famous volcanoes, e.g. Etna, Krakatoa, Vesuvius. Consult Volcanoes, G. W. Tyrrell, 1931; Volcanoes as Landscape Forms, C. A. Cotton, 1944; Volcanoes, New and Old, S. N. Coleman, 1950.

Gilbert Wilson, Ph.D.

Volcano. Group of three small islands in the N. Pacific Ocean, S.W. of the Bonin Islands. Iwojima (q.v.) is the central island of the group.

Vole. Genus of small rodents. Voles are commonly confused with rats and mice, from which



Vole. Two specimens of the British bank vole

they can be distinguished by their short tails, blunt heads, and comparatively bulky bodies. Three species occur in England and Scotland. The field vole (*Microtus agrestis*), commonly called the field mouse, is a little larger than a house mouse and has brown fur on the back and greyish white beneath. The bank vole (*Clethrionomys glareolus*) is slightly smaller, and has yellowish red hair on the back with grey under parts and whitish feet. It is found locally in England and the S. of Scotland, and lives in crevices in banks. The water vole (*Arvicola amphibius*), commonly known as the water rat, is about 8 ins. long in body, and has soft yellowish brown fur.

Volga (ancient Rha). River of European Russia, the longest in Europe. It rises in a small lake in the Valdai Plateau in the Kalinin region, flows from W. to E. as far as Kazan, turns S.W. from Kuibishev, and after Stalingrad finally turns S.E. to enter the Caspian Sea through a delta with about 200

mouths. It is from 2,000 to 2,500 m. in length, and is navigable for nearly the whole of its course. Its waters are full of fish, especially salmon and sturgeon. Various canals, uniting its tributaries to those of the Neva, form a medium of communication between the Caspian and the Baltic, and others with the Black and White Seas. Chief tributaries of the Volga are the Oka and Sura on the right, and the Tvertsa, Kama, and Samara on the left. The most important towns by which it passes are Kalinin, Rybinsk, Yaroslavl, Kostroma, Gorky, Kazan, Ulyanovsk, Stavropol, Kuibishev, Saratov, Stalingrad, and Astrakhan. The prolonged battle of the Second Great War in 1942 on the right bank of the Volga is described under Stalingrad, Battle of.

Volhynia. Region of Ukraine S.S.R. Lying between Kiev and the Polish border, it is a flat and fertile dist., the soil in great part consisting of the famous black earth. The chief mineral products are iron, saltpetre, pyrites, sandstone, and lignite. In the Middle Ages Volhynia was a separate principality, with Zhitomir its capital.

Völkischer Beobachter (Ger., people's observer). Principal and earliest Nazi newspaper. In the main it was the property of Hitler through a firm in which he was associated with his one-time co. sergt.-maj. Amann. Based on a small local periodical which Hitler bought with funds furnished by Roehm, it began to appear as his party organ in 1921; was suppressed after the "putsch" of 1923; and reappeared Feb. 26, 1925, as a large-scale, ambitious paper, first weekly, then from March daily. Its editor from 1932 was Alfred Rosenberg. In 1933 a N. German edition was started in Berlin, and both editions soon reached a circulation of about 750,000, subscription being expected as a proof of loyalty from civil servants, etc. It ceased to exist with the collapse of the Nazi regime.

Volkssturm (Ger., people's assault). Body raised in Germany during the Second Great War, somewhat analogous to the British Home Guard. Hitler proclaimed the formation of this last emergency levy in a broadcast on Oct. 18, 1944. It was modelled closely on Nazi party lines, all bn., co., and group commanders being trusted party men. Himmler was at its head. Every man from 16 to 60 not in the army had to register for the Volkssturm; members all

over Germany took the oath of allegiance on Nov. 12, 1944. Their "uniform" was a white armband inscribed *Deutscher Volksturm-Wehrmacht* (German people's assault force), though every effort was made to provide a full uniform of some kind, if only a tram conductor's or fireman's, members being afraid that in civilian dress with only an armband they might be taken by the Allies for franc-tireurs. Their duty was to defend the town or village where they lived. They took part in the defence, e.g. of Trier in the W., Danzig (Gdansk) in the E. The Salzkammergut area of Austria was chosen as their h.q. Their efforts made little difference to the campaign in Germany.

Volley (Fr. *volée*, flight). Simultaneous discharge of their firearms by a body of troops. Volley firing finds its greatest use when a body of enemy troops are surprised. The term is also applied to the firing of salutes.

Volo or **BOLOS**. Town of Greece. It is situated at the head of the gulf of the same name, at the foot of Mt. Pelion (q.v.), in Thessaly. It is 35 m. S.E. of Larissa, with which it is connected by rly., has a general trade, and is the seat of a Greek metropolitan. During the First Great War it was occupied by British and French troops in 1917. Pop. approx. 30,000.

Vologda. Town of the R.S.F.S.R. In the region of Vologda, which formerly comprised an immense forested district, it is 110 m. N. of Yaroslavl, and has rly. communication with Leningrad and Moscow. Manufactures include leather goods, cloth, candles, and soap. Pottery, glass, and cement factories were started under the Soviet regime. In the Middle Ages Vologda was a centre of the fur trade. Its importance rose when Archangel was opened as a port, but declined with the founding of St. Petersburg (Leningrad). Pop. 95,194.

Volpi, GRUSEPPE, COUNT (1877-1947). Italian politician and industrialist. A Venetian, born Nov. 19, 1877, he abandoned legal studies to represent Italian commercial firms in the Balkans, and was one of the negotiators of the treaty of Ouchy, 1913, which ended the Italo-Turkish war. This led to his being appointed vice-president of the Balkan financial conference in Paris. He negotiated a settlement with Yugoslavia over the Fiume dispute, 1920, and was governor of Tripolitania 1921-25, being made a peer. As finance minister during 1925-28 he negotiated Italy's war debt with Great

Britain and the U.S.A. Control of 42 companies connected with the hydro-electric industry gave him wealth and power. Dismissed by Mussolini in 1943 from his post as president of the fascist chamber of manufacturers, Volpi fled to Switzerland, but later returned to Italy, where he was arrested by the Germans and again escaped. After the war he was acquitted on a charge of carrying on fascist activities. He died Nov. 16, 1947.

Volpone or **THE FOX**. Comedy by Ben Jonson. It was first produced at the Globe, Southwark, 1605, and then at Oxford and Cambridge universities (to which it is dedicated). A tremendous satire on avarice and one of Jonson's greatest dramatic works, it retrieved his position in the theatre, and remained a popular piece until the end of the 18th century. With-in recent times it was first revived at the Lyric, Hammersmith, 1921. A fine interpreter of the title part was Donald Wolfitt.

Volsci or **VOLSCIANS**. People of ancient Italy, of unknown origin. Their territory, the extent of which varied from time to time, lay on both sides of the river Liris (Garigliano), in central Italy. Their language was more nearly related to Umbrian than Oscan. The Volscians were subdued by the Romans in 338.

Volsinii. Metropolis of the 12 communities of ancient Etruria. Situated on a hill at the confluence of the Chiana and Paglia, after several wars with the Romans it was captured and destroyed about 280 B.C. The inhabitants were removed to a new site about 8 m. to the S.W. See Bolsena; Orvieto.

Volstead, ANDREW J. (1860-1947). American politician. Born of Scandinavian parents in Goodhue co., Minn., he was educated at St. Olaf's college and Devonah institute, and called to the bar in 1884. At Granite Falls, Minn., he became president of the board of education, city attorney, and mayor. A Republican with some leaning to the Left, he was elected to congress in 1903, retaining his seat until 1923. He died Jan. 20, 1947. This ardent teetotaler is known as the author of the Volstead Act, which in 1919 became the 18th amendment to the constitution and enjoined prohibition (q.v.) throughout the U.S.A. until it was reversed by the 21st in 1933.

Völsunga Saga. Heroic tale written in Iceland in the 13th century. The story is common to the Teutonic peoples; it is given in the German *Nibelungenlied*,

and part of it is in the English *Beowulf*. It sets forth the adventures of Völsung and his descendants, the chief hero being Sigurd, slayer of the dragon Fafni and lover of Brunhild the Valkyrie; he being treacherously given a draught of forgetfulness marries Gudrun, which leads to the deaths of Sigurd and Brunhild. The second part of the saga relates the tragic lives of Gudrun and her children. A translation of the *Völsunga Saga*, by Eiríkr Magnússon and William Morris, was published in 1870, and Morris issued in 1876 his own poetical version of the story, *Sigurd the Völsung*. See *Brunhild*; *Nibelungenlied*; *Siegfried*.

Volt. In electricity, the unit of electromotive force, pressure, tension, or potential difference. One volt is the electrical pressure which, if steadily applied to a conductor whose resistance is 1 ohm, will produce a current of 1 ampere. It is equal to 10^8 electro-magnetic units of E.M.F. It is so named from Alessandro Volta (q.v.). See *Electricity*; *International Units*.

Volta or **LA VOLTA** (Ital., the turn). Round dance of Italian origin. Of the same measure as the courante (q.v.), it was danced in England in Shakespearean times, and is sometimes regarded as the forerunner of the waltz (q.v.).

Volta. River of W. Africa. It originates in the French Sudan in two headstreams, the Black and Red Volta, and flows through the jungle forest of the Gold Coast Colony S.E. and S. to the Bight of Benin at Adda. Navigation is impeded by the bar at the mouth and by numerous rapids. Its total length is about 900 m., and the lower 250 m. are navigable by small vessels during the floods.

Volta, ALESSANDRO, COUNT (1745-1827). Italian physicist. Born at Como, Feb. 18, 1745, he became professor of physics there, 1774, and at Pavia, 1779, retiring 1804. He died at Como, March 5, 1827. Volta made many important discoveries in electricity. In 1794 he brought out his condensing electroscope, and in 1800 the electric pile, followed closely by the first voltaic battery by which his name is commemorated. The friend of Buffon, Galvani, and Lavoisier, he received the Copley medal of the Royal Society, 1791. In 1801 Napoleon saw his experiments and struck a medal in his honour.

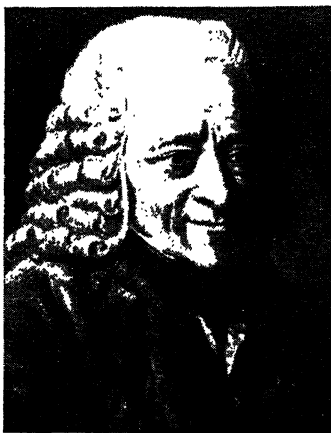
Voltaic Cell. Primary cell in which chemical energy is converted into electrical energy. See *Cell*, p. 1883.

Voltaire. Assumed name of the French writer, François Marie Aroutet (1694–1778). He was born in Paris, Nov. 21, 1694, the son of a notary, and was educated by the Jesuits at the Collège Louis-le-Grand. He reluctantly studied law for a while, but subsequently lived on an allowance, dabbling in literature and making his way in society by his wit and manners. His wit, however, being exercised at the expense of established institutions and persons of importance, repeatedly got him into trouble, and he was often punished, sometimes by being sent to the Bastille, and sometimes by being exiled from the capital. Yet he already began to make his mark as a dramatist; *Oedipe*, produced in 1718, ran 45 nights at the Comédie Française.

In 1725 Voltaire's talent for epigram gave dire offence to the Chevalier de Rohan-Chabot, whose lackeys chastised him in their master's presence. In vain he sought redress, and when it became known that he was taking lessons from a fencing-master with a view to a duel, he was again confined in the Bastille. On his release he obtained permission to go to England, where he remained from May, 1726, until the early spring of 1729. Voltaire's acquaintances in England included Pope, Bolingbroke, Gay, Swift, Lord Chesterfield, and Samuel Clarke, the expositor of Newton's philosophy. He became an admirer, not only of Newton and Locke, but also of the British constitution, and his subsequent attitude towards the French political system was much influenced by his observation of its working. While in England he published his epic, the *Henriade*, and wrote his *History of Charles XII* and *Letters on the English*.

Soon after his return to France, Voltaire amassed a fortune by speculation. He secured a share in some profitable army contracts, acquired a large interest in a commercial house at Cadiz, and lent money at a high rate of interest to the duc de Richelieu and other aristocratic friends. For the rest of his life he was rich, and could write without regard to pecuniary considerations. In 1734, however, the French government, enraged by the appearance of his *Letters on the English*, issued an order for his arrest, but left him unmolested when he took refuge in the country house of Mme. du Châtelet, at Cirey. This friendship, though punctuated by frequent quarrels, continued until her death in 1749. During nearly the whole of that

period Voltaire made his home with her, working diligently all the time. Written during those years were the plays *Mérope*, and *Mahomet*, *Dialogues on Philosophy*, the scandalous *La Pucelle*, and *The Age of Louis XIV*. Voltaire was in 1746 elected to the French Academy.



After the death of Mme. du Châtelet, Voltaire was persuaded to take up his residence at the court of Frederick the Great, who had conceived a boundless admiration for his talents. He was received almost as a demigod, but his relations with his royal patron gradually became strained, and they parted with mutual anger in 1753. The breach was afterwards partially repaired by correspondence, but the two great men never met again. Voltaire, after some wanderings in Alsace and Switzerland, finally settled at Ferney (*q.v.*), on French soil, but close to Geneva. There, with his niece, Mme. Denis, keeping house, he resided until nearly the end of his long life.

The years left to him were well filled, and his fame continually grew. He was the wealthiest, most celebrated, and most active man of letters in the world. He kept open house for distinguished strangers from all countries; he established important industries on his estate; he wrote books of all kinds, including that brilliant satirical tale *Candide*, 1759; he combated the puritanical objections of the Genevans to the theatre; he conducted a voluminous correspondence, and he acquired a new reputation as a pamphleteer, bent upon overthrowing the tyranny of superstition, and compelling the redress

of judicial errors. *Écrasez l'infâme* (lit. crush the infamous one) was the watchword of his campaign against the Jesuits. Victims of injustice whose cases he caused to be reviewed and revised included Calas, Sirven, la Barre, and Lally (*q.v.*). In 1778 Voltaire was persuaded to revisit Paris. His journey thither was a triumphal progress, but the strain and excitement were too much for him; after attending a performance of his last play, *Irène*, he was taken ill, and died May 30. His remains were transferred to the Panthéon in 1791.

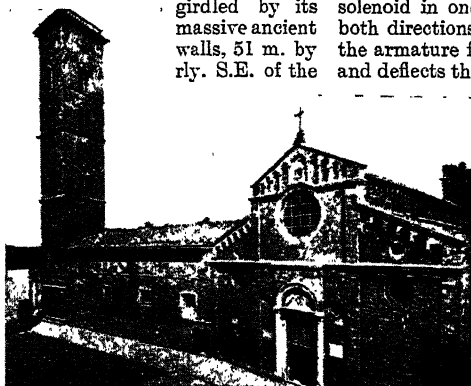
Voltaire's genius is incontestable, yet his fame cannot be said to rest upon any particular piece of constructive work. He was not a great dramatist, though he wrote successful plays. He was not a great historian, though his contributions to history are always luminous and readable. His name is not associated with any specific political or metaphysical system. His rôle, in short, was mainly critical and destructive, and he may be said to have been the incarnation of the critical and destructive forces of the 18th century. The fact that many of his works date is a tribute to the efficiency with which he attacked abuses now ended. In that sense he was a forerunner of the Revolution. His deadly wit and indefatigable energy cleared the ground on which a new structure could be built. He was not an atheist, but a deist. With outstanding wit and intellect, with a passion for justice and liberty, he yet emerges as an unlovable man, quarrelsome and unscrupulous.

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Voltameter. In electricity, an instrument for measuring the quantity of electricity passing through a circuit, by the decomposition of an electrolyte. The voltameter in general use consists of a platinum dish supported on a metallic tripod, and containing a solution of pure nitrate. A silver plate is suspended in the dish and connected with the positive side of the circuit, as anode, the dish itself being the cathode. Passage of current causes silver to be dissolved from the plate into the solution and deposited on the dish, the weight of

which, before the experiment, is known. When an observed time has elapsed the dish is emptied, dried, and re-weighed. The weight in grammes of the deposit divided by the constant '001118 gives the total quantity of electricity (in coulombs).

Volterra. City of Italy, in the prov. of Pisa. It stands at an elevation of 1,800 ft. on a hill, encircled by its massive ancient walls, 51 m. by rly. S.E. of the



Volterra, Italy. West front of the cathedral, consecrated by Pope Calixtus II in 1120, and enlarged in 1254

city of Pisa. Principal buildings are the cathedral (1120), the Palazzo Municipio (1208), the Palazzo Tagassi with a national museum, and the citadel, now a prison. Volterra, the Etruscan Velathri, was one of the 12 cities of the Etruscan League. During the Second Great War it was captured July 9, 1944, by U.S. troops, the Germans having evacuated it after fighting hard in the environs. The roof of the cathedral was partly damaged, the church of S. Addolorata had its roof tiles blown off; other churches and the palaces were less harmed.

Voltmeter. Electrical instrument to measure potential difference or electromotive force in volts. The type commonly used for engineering work is a sensitive, graduated galvanometer similar in principle to an ammeter (*q.v.*). In the moving-coil voltmeter the current traverses a fine coil pivoted in the field of a permanent electro-magnet, and sets up a second field which reacts against the first and causes the coil, and a pointer attached thereto, to move in opposition to light springs. The resistance of the voltmeter circuit is purposely made high so that the current shall be too small to affect the P.D. or E.M.F. between the points in contact with the terminals of the voltmeter. This instrument is suitable for continuous currents only, as a reversal of current-direction would reverse the travel of the pointer.

In moving-coil voltmeters for alternate currents, an external electro-magnet takes the place of the permanent magnet of the D.C. voltmeter, and the two being in series, reversal of direction has no effect. Moving-iron voltmeters have an armature of this metal attached to the pointer and passing into the centre of a solenoid or hollow coil. Current traversing the solenoid in one direction only, or both directions alternately, draws the armature further into the coil and deflects the pointer. Measure-

ment of very high voltages requires electrostatic instruments based on the principle of the quadrant electrometer. See *Electrometer*.

Volturno. British emigrant vessel. While going from Rotterdam to America she caught fire during a hurricane in the Atlantic, Oct. 9, 1913. Out of the

654 persons aboard, 133 were lost. The remainder were saved by the eleven vessels which came in response to wireless calls.

Volturno. River of Campania, Italy. It rises in the Apennines, and flows S.E., then W. past Capua to the Gulf of Gaeta in the Tyrrhenian Sea. It has a length of about 105 m. and its main affluent, the Calore, is almost as long. On its banks Garibaldi defeated the army of Naples in Oct., 1860.

In their retreat N. through Italy in the Second Great War, the Germans formed a defensive line on the Volturno river with the object of halting the Allied 5th

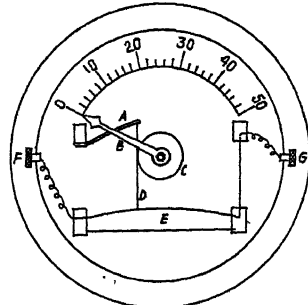
army. On the night of Oct. 12-13, 1943, Gen. Clark, Allied 5th army commander, launched a full-scale assault across the river. One U.S. infantry brigade in rubber boats was over it by dawn and consolidated a bridgehead to allow a pontoon bridge to be constructed. The attack in the British sector was less successful until the 15th, when the Guards crossed by one of the U.S. bridges. Further crossings were made at Grazzanise, and a landing on the coast just N. of the river, and by Oct. 16 the Germans had been forced back from the river line.

Voluntary. Generic name given to an organ piece before, after, or in the course of a church service, and probably so called because it does not form an integral part thereof. During the 18th century the term was often used by composers to designate pieces specially written for that purpose. The voluntary still flourishes in church music under a variety of other names. See *Organ*.

Voluntary Aid Detachments.

Bodies of civilians, some of men and some of women, numbered and registered at the War office, and organized under the Haldane scheme by the British Red Cross Society, the territorial county association, or the St. John Ambulance association or brigade, in every county of the U.K. to render first aid in case of emergency. Before the First Great War, the detachments of the British Red Cross and Order of St. John were organized to be ready at a moment's notice, and in Oct., 1914, the women decided to work together as a joint committee known as the Joint Women's Voluntary Aid Detachments, popularly V.A.D.s. During the war thousands of women were attached to the military hospitals as V.A.D.s or auxiliary helpers, and a large number of V.A.D. hospitals were established.

Shortly before the Second Great War, the ancillary nursing services of the British Red Cross, St. John ambulance brigade, and St. Andrew ambulance corps (Scotland) were incorporated into the V.A.D. At the outbreak of war the organization was mobilised, members serving both full and part time as civil defence auxiliaries. The setting up of nurseries to take children from evacuated areas widened the scope of V.A.D. activities. There was a council of representatives of the Admiralty, War office, Air ministry, and the orders of St. John, St. Andrew, and British Red



Voltmeter. Hot-wire type. Current entering at F heats the wire E, which expands against the tension of the spring A, B, C, connected to the pointer B. The movement of the pointer is in direct proportion to the voltage, since it measures the expansion of the heated wire. G is the return terminal

Cross, until in 1944 it was replaced by the V.A.D. standing committee to form an official link between the original voluntary organizations and the services to which members were mobilised under the National Service Act. *See* Red Cross Society.

Voluntaryism. Opinion that a church should depend for support entirely on voluntary contributions, and not be maintained by endowments guaranteed by the state, or controlled in the conduct of its affairs by the authority of the state. In Great Britain this is the view of nonconformists, and of a small section of the Church of England. *See* Church of England; Disendowment; Disestablishment.

Voluntary System. Organization of public service on a basis of free will. The term is particularly applied to the system of raising men for the armed forces by voluntary enlistment, and is thus the opposite of compulsory military service or conscription. In elementary education the voluntary system, partly maintained by voluntary subscriptions, prevailed in Great Britain until 1870, after which date the proportion of board or council schools rose rapidly.

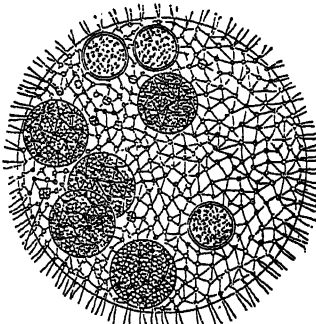
Volunteer (Lat. *voluntarius*, of free will). One who offers his services, particularly for any arduous or dangerous work, without compulsion or thought of substantial reward. The term is applied in a special sense to those who offer to serve the state under arms.

In Great Britain voluntary training for home defence on a national scale dates from the Napoleonic Wars, though the train-bands of Stuart times were largely a volunteer force; and in 1794 and 1803 the threat of invasion brought about 400,000 men into the ranks of the volunteers. From the first the adjustment of relations between part-time soldiers imbued with the civilian spirit of independence and the military authorities was a difficult matter, and full recognition of the movement was always given grudgingly, owing to disbelief in the value of half-trained men, and to the belief that the movement deprived the regular army of valuable recruits. Nevertheless, in 1859 the renewed fear of invasion brought about the formation of volunteer rifle corps throughout the country, and the National Rifle Association was founded in the same year. An Act of 1863 defined the conditions of service of the new force, and authorised a capitation grant of 30s. a year in respect of each efficient volunteer.

The volunteer rifle corps and the yeomanry became in 1907 the Territorial Force and in 1921 the Territorial Army (*q.v.*).

Until the First Great War, the British regular army was recruited on a voluntary basis, in both peace and war, but in 1916 compulsory service was introduced. In 1914 semi-military volunteer organizations came into existence: *e.g.* Home Defence League, Athletes' Volunteer Force; these soon were recognized by the War office and developed into the Volunteer Force, which provided preliminary training for men ultimately called up for military service.

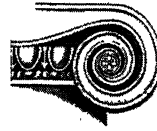
After the war the regular army reverted to voluntary enlistments. Some time before the outbreak of the Second Great War, the newly formed A.R.P. (later civil defence) organizations were on a strictly voluntary basis, but later such services became compulsory according to the direction of the ministry of Labour and the military authorities. Similarly the Local Defence Volunteers (later Home Guard)



Volvox globator. Entire colony, highly magnified, enclosing several daughter colonies

From The Cambridge Natural History (Macmillan)

were enlisted on a voluntary basis but ultimately became compulsory. When service in the armed forces was compulsory according to age and reservation groups, men could anticipate their call-up by volunteering. Although the R.A.F. absorbed large numbers of conscripts, all air crew personnel were volunteers, and no conscript could be compelled to fly as a member of an operational crew. In the army, commandos, parachute troops, and other specialised fighting units were composed entirely of volunteers. After the war, conscription was retained for the three services; but the Royal Navy was able to maintain establishment on long-term voluntary enlistments *See* Army, British; Civil Defence; Home Guard; National Guard.



Volute in architecture

Volunteers, IRISH. Name given to volunteer forces raised in Ireland. The first units were raised in 1779 for home defence, and it

was the existence of this considerable armed force which compelled the British government to grant free trade with Ireland. The example of Ulster in raising volunteers in 1913-14 was promptly followed by the Nationalists in the rest of Ireland, and after the Dublin rebellion, 1916, the Irish volunteers developed into the guerrilla force known as the Irish Republican Army (*q.v.*). *See also* Sinn Féin.

Volute. In architecture, the spiral scroll forming the principal feature of the Ionic capital, and of the Roman composite capital. *See* Composite Order; Ionic Order; Rome: Architecture.

Volvox. Genus of small flagellate protozoa, common in many ponds. It lies so nearly on the border line between the animal and vegetable kingdoms that most botanists class it as a green alga. It consists of a hollow sphere of unicellular individuals, each possessing two flagellae, and the whole united together by a gelatinous envelope. In the common pond species, *Volvox globator*, there may be 10,000 individuals in the colony, which progresses by rolling along in the water. As with plants, the cells contain chlorophyll, and build up starch granules. Reproduction is of two kinds. Sometimes the cells divide up and thus form fresh colonies; while in other examples certain cells are specialised for reproductive functions.

Volvulus. Physical condition in which a coil of intestine becomes twisted on itself, thus interfering with the supply of blood and the passage of its contents. This may give rise to the dreaded intestinal obstruction if it does not free itself, or is not diagnosed and freed.

Vomiting. Return and expulsion from the mouth of part or whole of the stomach contents. The stomach walls contract, the diaphragm is pushed downward, and the abdominal muscles contract strongly. The cardiac orifice of the stomach relaxes and the pressure of the abdominal muscles expels the contents. The vomiting nerve centre in the brain may be excited to action by influence from the stomach itself or from other parts of the body, or by

poisons acting upon it directly. The causes of reflex vomiting include pharyngeal and gastric causes; intestinal, peritoneal, and general visceral causes; and disorders of the nervous system.

Von. German word meaning of, used as a prefix to surnames, the equivalent of the French *de*. First used indiscriminately, the *von* gradually became a mark of distinction, and its use was confined to those of noble birth. Rulers exercised the right of ennobling others, and this took the form of allowing them to use the prefix *von*. In alphabetising German names in this work, the *von* is disregarded, e.g. Leopold von Ranke appears under Ranke.

Vondel, Joost van den (1587-1679). Dutch dramatist and poet. He was born Nov. 17, 1587, at



Joost van den Vondel, Dutch dramatist

Cologne, son of an Anabaptist exile from Antwerp, and became a hosier at Amsterdam, and afterwards a government official. Strongly influenced by French and Greek poetry, he became a

member of the literary circle in the house of the Visschers. His drama, *The Pasha*, 1612, was followed by lyrics and a series of adaptations of Sophocles and Euripides. His original tragedies include *Jerusalem Laid Waste*, 1620; *Palamedes*, 1625, written in protest against the execution of Oldenbarnevelt; *Gijsbrecht van Aemstel*, 1637; and his masterpiece, *Lucifer*, 1654 (Eng. trans. 1898), which is thought to have influenced Milton's *Paradise Lost*. Vondel died at Amsterdam, Feb. 5, 1679. A *Life*, by A. J. Barnouw, appeared in 1925.

Voodoo or Vaudoux. Superstitious cult current in some W. Indian islands, especially Haiti. Introduced by early slaves recruited from Dahomé, its secret rites, performed by a priest and priestess, are based upon the worship of the green snake.

Voortrekker (Dutch, forward rider). Name given to the Dutch colonists who migrated in 1836 from the Cape to the areas that became the O.F.S., Transvaal, and Natal. After Napoleon's final defeat the British in 1814 paid the Dutch £6 million for the Cape, of which they had taken possession when the Netherlands was under French control. There were then

some 27,000 Dutch in the country; the first British settlers arrived in 1819. Disagreement between Dutch and British arose; and in 1836 about 10,000 Boers (Dutch farmers) set out in small groups on what is called in S. Africa the Great Trek. They travelled by ox-wagon across the trackless veld. The going was not difficult, but water was hard to find. An average day's journey was 12 m. On the way many died, and all suffered hardship. Those who reached the new lands had to defeat the semi-nomadic tribes inhabiting them before they could make secure settlements. Legally the voortrekkers remained British subjects. The Voortrekker memorial at Pretoria, consisting of a monument and an amphitheatre, was dedicated in 1949. See Kruger; South African War.

Vorarlberg. Austrian province. The name means the land beyond the Arlberg Pass, given to it in the 18th century when certain small areas were united under this name. The prov. adjoins Bavaria, Switzerland, Liechtenstein, and Austrian Tirol; parts of its boundary are formed by the Rhine and Lake Constance. It is drained by the Ill, and is almost wholly mountainous. Bregenz is the capital. Area, 1,005 sq. m. Pop. 183,266.

Voronezh. A city of the R.S.F.S.R. Chief city of the region of the same name, it is an administrative centre of the black earth area. Built along the Voronezh river, 5 m. above its confluence with the Don, 125 m. E. of Kursk, it is a large rly. centre, and has machine-making and engineering works, aeroplane factories, steam flour mills, and makes bricks, paint, and alcoholic drinks. A centre of silk growing, it has an agricultural institute. There are a university and several museums.

The site was occupied in the 11th century by a Khazar town, abandoned in the later Middle Ages. A fort was built in 1586, burned by the Tartars in 1590, but rebuilt. Here Peter the Great started the first Russian shipyards in 1695, when he constructed a flotilla to send to the Sea of Azov to fight the Turks. The town was destroyed by fire in 1703, 1748, and 1773, and suffered from chaotic building during the 19th century. During the Second Great War the city was 85 p.c. destroyed in violent fighting during July, 1942, when 100,000 Germans, Hungarians, and Rumanians were said by the Russians to have been killed in an effort to take Voronezh at any cost. The

Don ran with blood, the Germans used tanks, aircraft, smoke screens, flame throwers, as well as masses of infantry. They succeeded in establishing themselves in the W. suburbs, but could get no farther. In Aug. the weight of the fighting shifted away to the S. The Russians freed Voronezh entirely Jan. 25, 1943. After the war, the principal buildings were restored in the early 19th century style. The pop. in 1939 was 327,000.

Voronoff, SERGE (b. 1866). Russian surgeon. Born July 10, 1866, and educated for the medical profession in Paris, he became a surgeon there. He worked in a military hospital and later was made director of a biological laboratory and of experimental surgery in the Collège de France. Voronoff's name is prominently associated with attempts at rejuvenation by transplanting the sexual glands of young animals. In the lower animals those of an animal of the same species are used; in man those of one of the higher apes. Numbers of these experiments have been successful, the animal or man into whose body the vigorous gland is transplanted losing to a large extent the characteristics of senility, and manifesting for a short time the mental, physical, and sexual vigour of a much younger individual. Voronoff wrote on *Articulation Grafting*, *Ovarian Grafting*, and *Thyroid Grafting*.

Voronov, NIKOLAI NIKOLAEVICH (b. 1899). Russian soldier. He joined the Red army in 1918, then studied at a military academy at Leningrad. After serving as commandant of the senior artillery school there, he became chief of artillery to the army, reorganizing the system of training and starting special gunnery schools. He fought against the Finns in 1939-40, on the Moscow front, 1941, and at the battle of Stalingrad, after which he was promoted marshal of artillery. He received the Order of Suvorov, 1943, and that of Lenin, 1945.

Voroshilov. Town of Primorskaya, Far Eastern Region, R.S.F.S.R. Formerly Nikolsk, it is about 45 m. N.W. of Vladivostok, on the main rly. to Harbin. It is built on the river Yug, and was greatly developed during the 1930s. Pop. 70,628. Another town of the same name is in Ukraine S.S.R.: pop. 54,794.

Voroshilov, KLEMENTI EFREMOVICH (b. 1881). Russian soldier. Son of a workman, he was born at Verkhnyi, Ukraine, and in 1903 joined the Social Democratic party. Having been exiled to Si-

beria in 1907 for revolutionary activities, he escaped to Baku, and during the First Great War worked as a revolutionary organizer, accepting military service after the Bolsheviks seized power.



K. E. Voroshilov,
Russian soldier

He was a pioneer of the Red army cavalry, and a member of the Communist party central committee from 1921. People's commissar of the army and navy, 1925, Voroshilov became vice-premier in 1940. After the German invasion of Russia in the Second Great War, he was in command of the N.W. front and helped to form new Russian armies. A member of the state committee of defence (war cabinet), he accompanied Stalin to the Teheran conference, Nov.-Dec., 1943. He was Russian c.-in-c. and chairman of the Allied control commission in Hungary, 1945-46. He was awarded the Order of Lenin, 1945.

Voroshilovgrad. City of Ukraine S.S.R., in the region of the same name. Formerly Lugansk, it is about 180 m. E. of Dnepropetrovsk, on the Lugan, a tributary of the Donetz. The town makes locomotives and armaments, while mines in the neighbourhood yield great quantities of iron, coal, and anthracite. Lugansk owed its importance to ironworks established by an Englishman on behalf of the Russian govt. in 1795. After the revolution of 1917 it greatly developed industrially. The scene of bitter fighting during the Second Great War, it was captured by the Germans, July 19, 1942, in their drive towards Stalingrad, and recovered by the Russians under Gen. Vatutin, Feb. 14, 1943, after a fierce 2-day battle through elaborate defences and anti-tank traps constructed by the Germans. Pop. 213,000.

Voroshilovsk. Russian city, in the North Caucasian area, R.S.F.S.R. Formerly Stavropol, it is 150 m. E. of Krasnodar, and N. of the Central Caucasian mts. The centre of a district rich in minerals, it has oil refineries, and is an important rly. junction. During the Second Great War it was captured by the Germans in their Caucasian campaign of 1942, and retaken by the Russians, Jan. 21, 1943. Pop. 85,100.

Vortex. In hydrodynamics, a portion of fluid in rotational mo-

tion. The motion is by supposition perfectly continuous, so that when the axes of rotation of neighbouring particles are joined, they form a curve which returns into itself, or reaches both bottom and top of the rotating fluid. These lines or curves are called vortex lines. The long filament of rotating fluid which forms an eddy must either be a closed ring or end on the boundary walls of the system.

Vorticella OR BELL ANIMALCULE. Small protozoan, common in ponds. It resembles a bell with a ciliated mouth, and is attached to water plants and other objects by a slender stem. It occurs in colonies, and the stem can be contracted like a spiral spring, drawing all the bells together into a little jelly-like mass.

Vorticism. Art movement. Initiated by Percy Wyndham Lewis shortly before the First Great War, this style of painting was an offshoot of Cubism (*q.v.*). Its tenets were set forth in the founder's short-lived periodical, *Blast*, but it had few disciples among English painters.

Vortigern (*f.* 450). British king. Reigning in the S. and E. of England when Hengist and Horsa came to Britain, he enlisted the Saxons against the ravaging Picts and Scots, and granted them part of Kent as the price of their service; but eventually he waged war against them and was compelled to cede large portions of territory in Essex and Sussex.

Vos, JAN (1620-87). Dutch dramatist and poet. A follower of Vondel, he supported himself in Amsterdam as a glazier. His tragedy, *Aaron and Titus*, produced in 1641, gave him immediate fame, and Medea followed in 1662, but Vos did not live to fulfil the promise of his youth.

Vos, MARTEN DE (1531-1603). Flemish painter. Born at Antwerp, he studied under Frans Floris and in Rome and Venice. He became a fine and facile colourist, painted portraits of the Medici family and other illustrious Italians, and executed important decorations for churches at Antwerp, where he was dean of S. Luke's guild in 1572. He died at Antwerp, Dec. 17, 1603. His Crucifixion was placed in the Uffizi Gallery; *The Raising of Lazarus* is at Madrid.

Vosges. Mountain range of France. It forms the W. edge of the basin of the middle Rhine opposite the Black Forest, and is separated at its S. end from the Jura Mts. by the Gate of Burgundy. Mainly of granitic formation, the lower slopes are vine-clad, up to 3,600 ft. they

are forested with pine and beech, and above that they are pasture land. The rounded summits (ballons) attain heights exceeding 4,000 ft.—Ballon de Guebwiller, 4,667 ft.; Ballon d'Alsace, 4,083 ft. Lead, silver, copper, rock salt, and coal are mined. The range forms the W. edge of the Rhine rift valley, and presents a steep scarp to the E.

Vosges. French department. Chiefly formed of the prov. of Lorraine, it is adjacent to the depts. of Meurthe-et-Moselle, Meuse, Haute-Marne, Haute-Saône, Haut-Rhin, Bas-Rhin, Moselle, and the territory of Belfort. It includes the S. part of the Vosges Mts. (*q.v.*) and the Monts Faucilles, the valleys and forests making it one of the most picturesque districts of France. Rivers include the Moselle, Meurthe, Meuse, Vologne, Durbion, and Rupt; while Lakes Gérardmer, Longemer, and Retournemer are of glacial origin. The Vosges pine forests are some of the most notable in France. Cereals are grown, and vineyards, livestock, and dairy produce are important. Lead, copper, iron, and coal are found, and there are famous mineral springs at Contrexéville, Plombières, Bussang, Vittel, etc. Metal working and cotton and lacemaking are among the industries. Épinal (*q.v.*) is the capital, towns include Neufchâteau, Mirecourt, Remiremont, St. Dié, Rambervilliers, Vittel, Gérardmer, and Châtenois. Area, 2,303 sq. m. Pop. 342,315.

Vossius OR VOSS. Name of two Dutch scholars, father and son. Gerhard Jan Vossius (1577-1649), the son of a refugee from the Netherlands, was born near Heidelberg, and studied at Leyden, becoming director of the theological college there, 1614, and afterwards professor of rhetoric, chronology, and Greek. From 1632 he held the chair of history in the Athenaeum at Amsterdam. He died March 19, 1649. He was one of the first to view theological questions from a historical standpoint.

His son Isaac (1618-89), born at Leyden, became professor of history at Amsterdam at the age of 15, and afterwards librarian to Christina of Sweden. In 1670 he settled in England. Given by Charles II a prebendal stall at Windsor, he died there Feb. 21, 1689.

Votan OR ITZAMNA. Sun god of Mexico in the mythology which preceded the Maya civilization. He was supposed to have introduced laws and the earliest culture to the primitive peoples of Central America. See Mexico.

Vote (Lat. *vorere*, to vow). Act of indicating a preference at elections for representatives to parliament and other bodies. A vote is usually cast by ballot, *i.e.* marking a paper, a method which has the advantage of secrecy, although voting by show of hands, with the right of claiming a ballot, is still usual for company meetings and parish councils. Voting was known among the Greeks and Romans, but its widespread presence in the civilized world of today is due to the growth of representative institutions. Usually a bare majority is sufficient to elect a representative or decide an issue, but sometimes a larger majority is required. *See* Ballot; Election; Franchise; Proportional Representation; Women's Suffrage.

Vote of Credit. Sum of money voted by the British house of commons in a time of exceptional emergency. Usually the chancellor of the exchequer asks for a certain amount, and moves that a sum not exceeding the one named be granted to his majesty "beyond the ordinary grants of parliament." A vote of credit differs from an ordinary money vote, inasmuch as the purposes for which it is required are not stated except in the most general terms. If it were refused the government would leave office. *See* Parliament.

Voting Machine. Instrument for recording, registering, and counting votes at an election. Modern examples usually consist of a combined registering and adding mechanism. In the U.S. standard voting machine a separate key is provided for each candidate, the keys being arranged in rows and lettered and numbered. Each key is pointed and extends through the keyboard, swinging downwards to point to the name of a candidate. The voter, by the actuation of a lever, moves a curtain to screen the machine and unlock it for voting. The operation of one of the voting levers records a vote and resets the machine.

Vouet, SIMON (1590-1649). A French painter. Born in Paris, Jan. 9, 1590, he studied there under his father, and in 1627 was appointed principal painter to Louis XIII, who took lessons in pastel from him. Vouet was engaged on the decoration of the Louvre, the Luxembourg, the



Simon Vouet,
French painter

Palais Royal, and the palace of St. Germain. His Diana is at Hampton Court. He died in Paris, June 30, 1649. *Pron.* Voo-ay.

Vow (Lat. *votum*). Generally any solemn promise; in a religious sense, any voluntary and solemn promise made to God which may be physically but not morally violated. For examples in the O.T., *see* Gen. 28; Num. 6; Deut. 23; Judges 11; Ps. 61 and 132; N.T., Acts 18 and 21. As the Christian Church developed two classes of vows were recognized (1) concerning gifts; (2) affecting conduct, as of chastity, pilgrimage, and vows of the religious orders. The R.C. Church recognizes temporal, perpetual, conditional, absolute, simple, and solemn vows; and holds that the pope alone has the solemn authority to dispense from any but minor vows. The Church of England formally recognizes only the baptismal and marriage vows, though those of brotherhoods and sisterhoods are recognized by bishops at their discretion.

Vowel (Lat. *vocalis*, sounding). Modification of voice produced by different configurations of the mouth passages due to the action of the tongue, lips, and cheeks. Always there is a certain amount of obstruction, but not enough to cause the audible rustling or stoppage characteristic of consonants.

Writers on phonetics divide vowels into back (guttural) or front (palatal), according as the

consonant are relative terms, distinguishing open and closer utterances. Vowels indicate the maximum, consonants the minimum of opening of the mouth passages. *See* Consonant; Phonetics; Pronunciation.

Vranja, VRANJA, VRANJE, OR VRAJE. Town of Yugoslavia, in Serbia. It stands on the Morava, about 45 m. N.E. of Skoplje, has a rly. station, and was a flourishing commercial centre before the First Great War, in which it was captured Oct. 19, 1915, by the Bulgarians.

Vršac (Magyar, Versecz; Rum. Varset). Episcopal town of Yugoslavia. In the Banat, and formerly part of Hungary, it lies near the Rumanian frontier, 47 m. N.E. of Belgrade. The seat of a Greek bishop, it is also a rly. junction and locally celebrated for wine and brandy. Pop. 29,411. *Pron.* Vershats.

Vryburg. Town of British Bechuanaland, South Africa. It stands at 3,890 ft. alt., 145 m. N. of Kimberley by rly. The surrounding country is dry, but contains good pasturage. Stock-rearing is the main industry. Butter and soap are made. Pop. 5,300.

Vryheid. Town of Natal, S. Africa. It is 53 m. N.E. from Dundee and 290 m. N. from Durban, being connected by rly. with both. It stands at an alt. of 3,920 ft. and is the centre of a district in which coal and gold are mined. After being in Zulu-



Vrynwy, Wales. Reservoir for the water supply of Liverpool, formed by a dam across the Llanwyddyn valley

back of the tongue approaches the soft palate, or its upper surface approaches the roof of the mouth; high, middle, low, according to the height of the tongue; close (shut, narrow) or open (wide), according to the greater or less convexity of the tongue; rounded or unrounded, according to the position of the lips or cheeks. *A*, as in father, is a back, *i* a front vowel; *i* is a high, *e* a middle, *a* a low vowel; *a* is open, *u* is shut. The highest vowels are the most rounded. Vowel and

land, Vryheid was given in 1884 to a group of Boers who made it into a little republic. This lasted until 1888, when it became part of the Transvaal. In 1902 it was transferred to Natal. Vryheid is the seat of the bishop of Zululand, and has a Dutch Reformed church. Livestock, cereals, tobacco, and sugar are raised in the vicinity. Pop. 7,000.

Vrynwy. River and artificial lake of Montgomeryshire, Wales. The river rises in that county and

flows S.E. and N.E. to the Severn on the Shropshire border. Its upper valley has been made into a lake to supply Liverpool with water. The work was carried out between 1890 and 1905, and the water is conveyed by pipes to the destination, 68 m. away. The length of the lake is nearly 5 m. and it covers nearly 2 sq. m. Its capacity is more than 12,000 million gallons.

Vulcan. In Roman mythology, an old Italian deity, the god of fire. He was identified with the Greek Hephaestus (*q.v.*).

Vulcan. Hypothetical planet supposed to exist between Mercury and the sun. Leverrier calculated from perturbations of Mercury the position of the supposed planet. These perturbations have since been explained as an effect of relativity.

Vulcan. Pass in the Transylvanian Alps, Rumania. It rises to a height of 3,090 ft., and connects Targul Jiu in Wallachia with the colliery dist. of Petrozseny.

Vulcanite. Form of rubber made by mixing with sulphur. It is also known as ebonite (*q.v.*).

Vulgate (Lat. *vulgatus*, common). Name sometimes applied to the Septuagint (*q.v.*), but specifically to the Latin version of the Bible prepared by Jerome in the 5th century. Jerome's version was revised by order of Sixtus V, and issued in Rome in 1590, and revised again by order of Gregory XIV and issued in 1592. Contributions towards a revised text were made by Robert Étienne, 1528. In 1907 Pius X appointed a commission, of which Cardinal Gasquet was president, to prepare for another official version. See Bible.

Vulpecula (Lat., little fox). Small constellation placed by Hevelius parallel and near to the Arrow. A meteor stream radiates from it in June, and it contains the famous dumb-bell nebula, Messier 27.

Vulture (Vulturidae). Large birds of prey, which differ from the eagles and hawks in having the head and neck—except in one genus—more or less bare of feathers. They all have long, hooked beaks; the plumage is often loose and untidy, and the

claws are long and curved. They feed on dead animals and carrion.

The Griffon vulture (*Gyps fulvus*) is common in S. Europe, Asia, and N. Africa. It is about 40 ins. long, and has grey and brown plumage with a large white ruff round the throat. It is usually found in open country, and it nests among rocks.



Vulture. 1. The Egyptian species. 2. Griffon vulture. 3. The Black or Cinereous vulture. All these species are common to the Mediterranean shores and are found in parts of southern Asia. The Griffon is also found in S. Europe, while the Egyptian vulture occurs in most parts of Africa. W. S. Berridge, F.Z.S.

The Egyptian vulture (*Neophron percnopterus*) occurs around the Mediterranean, in most parts of Africa, and in S. Asia. It is about 2 ft. long, and has white plumage with a little brown and black. The Cinereous or Black vulture (*Aegypius monachus*) is a larger bird, having a length of over 40 ins. and black plumage. The head and neck are partly covered with white down, the bare skin of the rest being dull red. It occurs around the Mediterranean and in S. Asia.

The American vultures are classed in a separate family—Cathartidae—being distinguished by having the nostrils connected and by the contour feathers having no after-shaft. The bill is less admirably fitted for attack; the claws are less curved and not so sharp. They include the condor, king vulture (*Sarcorhamphus papa*), and Californian vulture (*Gymnogyps californianus*). See Condor; Lämmergeier; Secretary Bird.

V-Weapon. English abbreviation of German *Vergeltungswaffe*, reprisal weapon, of the Second Great War. V1, the flying bomb (*q.v.*), and V2, the rocket (see Rocket Propulsion and Weapons), were used to bombard London 1944–45. V3 was to have consisted of barrels 400 ft. long and 16 ins. in diameter, sited deep in the Channel cliffs on the French coast; incapable of elevation or traverse, the barrels were trained directly on London and designed to fire a projectile 16 ins. in diameter and 92 ins. long. The projectile was fired initially by

rocket discharge, and its barrel velocity boosted by the explosion of auxiliary charges contained in chambers. V4 would have been a rocket-propelled piloted missile discharged vertically from the ground and designed to attack bombers with cannon, rockets, or ramming, after which the pilot

would eject himself mechanically and come to earth by parachute.

Vyatka. This town and region of the R.S.F.S.R. are now called Kirov (*q.v.*).

Vyshinsky, ANDREY JANUAREVICH (b. 1883). Russian politician. Of Polish descent, he was born at Odessa and studied law at Kiev university. In 1902 he joined the Mensheviks, and for his part in the revolution of 1905 was imprisoned for a year. When the Bolsheviks seized power in 1917, he joined the Red army and was in the Communist party by 1920. Professor of jurisprudence at Moscow, 1925–27, he was deputy public prosecutor, 1933–39, and became prominent at the treason trials of 1936–38. He was promoted, 1940, vice-chairman of the council of peoples' commissars and deputy commissar for foreign affairs, and in 1949 foreign minister.



A. J. Vyshinsky, Russian politician

Vyshinsky became a formidable opponent in debate at inter-Ally and U.N. conferences from 1945, for he had vast knowledge of legal and parl. technicalities. He voiced Soviet opposition to the western Allies and used the veto on many important issues brought before the security council, including the Berlin blockade by Russia, 1948. Vyshinsky won the Stalin prize, 1947, for his work in legal science.

THE name of the letter W reveals its origin.

Neither the Greek alphabet nor the Latin knew it. It emerged with the development of early Latin cursive scripts as, indeed, a double u, that is to say, uu, to distinguish the consonantal sound of u from the vowel sound as represented by a single letter. As explained in the introduction to the letter U, there was originally no capital U, the letter V being used both for the vowel sound of u and for the consonant sound of v. The third con-



sonantal sound represented by uu in minuscule had as its capital letter a double V, and the form WV appeared in many of the earliest printed books, especially in France. English printers had taken a hint from the decorative and space-saving practice used by the writers of medieval MSS., of crossing the two capital letters (as was frequently done with a double o), and evolved the W as a distinct monogram, with a smaller version for the lower case. But handwriting still recalls the uu form.

W Twenty-third letter of the English alphabet.

It has the value of both a vowel and a consonant. It is called double u, being in form VV (UU). Its phonetic relation to u is the same as that of y to i. At the beginning of its utterance it resembles a vowel, but when the sound is being completed it inclines more to the consonantal value. It is sometimes mute, as in *two, sword*, and always before r, as in *wrath, wrong*. Before h its articulation is reversed, *what, which* being more correctly, though not universally, pronounced as if written *hreat, hwich*; or it is mute, as in *who, whole*. It never has a consonantal value when final, in which case it is always combined with another vowel. In Welsh it is a vowel, e.g. *cwm, pron. approx. coom*. See Alphabet; Phonetics.

Wa. Aboriginal hill-tribes of Mon-Khmer speech, E. of the northern Shan states, Burma. They number about 15,000.

Waal. River of the Netherlands, a branch of the Rhine. Nine miles E. of Nijmegen, the Rhine divides into the Neder Rijn and the Waal, the latter, the larger branch, flowing W. until, 2 m. E. of Gorinchem, it is met by the Maas or Meuse (q.v.) and becomes the Merwede. The chief towns on the Waal are Nijmegen, Tiel, and Zalt-Bommel. See Rhine.

Wabash. River of the U.S.A. Rising in Mercer co., Ohio, it flows S.W. across Indiana, forming in its lower course the boundary of that state and Illinois, and joins the Ohio river after a course of about 550 m. The Wabash and Erie Canal connects it with Lake Erie. It is navigable to Lafayette.

Wabash. City of Indiana, U.S.A., the co. seat of Wabash co. It stands on the Wabash river, 90 m. by rly. N. of Indianapolis, and is served by the Wabash and the Cleveland, Cincinnati, Chicago and St. Louis rlys. Industrial establishments include rly. workshops, a foundry, a cannery, paper mills, and engine and motor works. In the courthouse square is a 35-ton bronze statue of Abraham

Lincoln. Settled in 1883, Wabash was incorporated in 1854, chartered as a city in 1866. Pop. 9,653.

Wace, ROBERT (c. 1100-c. 1175). Anglo-Norman chronicler. Born in Jersey, he received favours from Henry I and Henry II of England, and was given a prebendal stall at Bayeux. The author of two rhyming chronicles, *Roman de Brut* and *Roman de Rou*, he gives valuable information on the history of England and Normandy. *Consult* Maistre Wace, Philpot, 1926.

Waco. City of Texas, U.S.A., the co. seat of McLennan co. It stands on Brazos river, 95 m. S. of Dallas, and is served by rlys. It is the seat of Baylor university, and is a leading cotton market. Waco was settled in 1849, and incorporated in 1856. Pop. 58,000.

Wad. In mineralogy, impure hydrated oxide of manganese of very variable composition, but resembling psilomelane, and occurring in black amorphous, earthy encrustations, or stains. Earthy cobalt or asbolan is a cobalt-rich variety, while lampadite contains copper. Wad results from the decomposition of other manganese minerals, and is sometimes used in the manufacture of chlorine and in umber paint.

Wadai. Dist. of French Equatorial Africa. Lying E. of Kanem, between Bagirmi and Darfur, in the Anglo-Egyptian Sudan, it forms a part of the Chad Territory. At one time a powerful native state, it accepted a French protectorate in 1903, although the French occupation of the country was not completed until 1913. Area, 170,000 sq. m. Pop. (est.) 1,000,000.

Waddington, CONRAD HAL (b. 1905). British biologist. He was born Nov. 8, 1905, and educated at Clifton and Sidney Sussex College, Cambridge. At first a geologist, he studied philosophy before becoming lecturer in zoology at Cambridge in 1932. During the Second Great War he was scientific adviser to the c.-in-c. of R.A.F. Coastal Command. In 1947 he was appointed professor of animal genetics at Edinburgh, and elected

F.R.S. Apart from many contributions to the scientific press, he wrote *The Scientific Attitude*, 1941, and edited a controversial work, *Science and Ethics*, 1942.

Waddington, WILLIAM HENRY (1826-94). French statesman. Son of an English manufacturer, he was born at St. Rémy-sur-Avre, Dec. 11, 1826, and educated at Rugby and Trinity College, Cambridge. He rowed in the 1849 university boat race, taking French nationality the same year. He was minister of education, 1873 and 1876-77, and as foreign minister attended the congress of Berlin (q.v.). Premier in 1879, he was ambassador in London 1883-93, and died in Paris, Jan. 13, 1894. He published works on numismatics and archaeology.

Wade, GEORGE (1673-1748) British soldier. Born in West-



George Wade,
British soldier

meath, he served in Flanders, 1692, and under Marlborough, 1702-03. Then he went to Spain, distinguishing himself at the battles of Almansa, 1707, and Saragossa, 1710. After the Jacobite rebellion of 1715, he held command in the Highlands, and from 1726 performed admirable work for ten years in the construction of military roads. Made a field-marshal in 1743, Wade commanded the British troops in Flanders. During the Jacobite rebellion of 1745 he was c.-in-c. in England, but superseded by Cumberland. He died March 14, 1748.

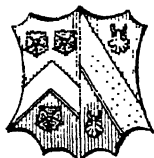
Wade, THOMAS (1805-75). British poet. Born at Woodbridge, Suffolk, he published a volume of poems before he was 21. His first play, *Woman's Love*, was produced successfully at Covent Garden by Charles Kemble in 1828, but a later piece, *The Jew of Arragon*, was a failure. He translated Dante. Wade died Sept. 19, 1875.

Wadebridge. Market town and river port of Cornwall, England. It is on the Camel estuary, 38 m

W.N.W. of Plymouth and 7 miles N.W. of Bodmin, and has rly. stations. A stone bridge of 15 arches, dating from about 1485, crosses the river here. The chief market town of N. Cornwall. Wadebridge has a fair agricultural trade, a foundry, and some shipping. Pop. 2,460.

Wadelai. Village of Uganda. It stands on the Bahr-el-Jebel portion of the Nile and is 206 m. S. of Gondokoro and 35 m. N. of the Albert Nyanza. It was occupied by the British in 1894.

Wadham College. College of Oxford university. It was founded in 1612 by Nicholas and Dorothy



Wadham College arms

Wadham of Merifield, Somerset, and is governed by statutes dating from that year. The head is the warden and the buildings are in Parks Road. The chapel, dating from the early 17th century, is a fine piece of work, and the garden is beautiful. Richard Congreve, Edward Beesly, Frederic Harrison, and other members, founded the English Positivist Society. Famous Wadham men include Robert Blake, Wren, Speaker Onslow, 1st Lord Westbury, 1st earl of Birkenhead, Viscount Simon, C. B. Fry, and Humbert Wolfe. See Oxford; Royal Society.

Wadhwan. Small state in E. Kathiawar, Bombay province, India, merged since 1948 in the Saurashtra Union. The walled city, 3 m. from a main line rly. junction of the same name, has an ancient temple of Ranik Devi—a Rajput lady who committed sati. The ruler is a Jhala Rajput.

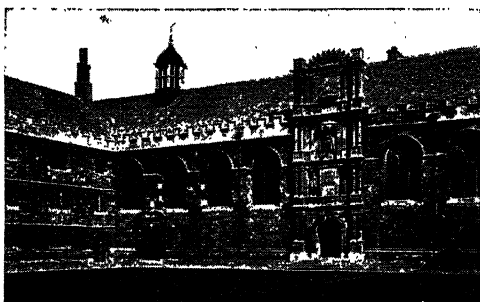
Wady OR **WADI** (Arab.). River course which is dry except for a short time during or immediately after rains. The term is confined chiefly to N. and E. Africa.

Wady Halfa OR **WADI HALFA.** Frontier town of the Anglo-Egyptian Sudan, just S. of the Egyptian border. It is on the E. bank of the Nile, 949 m. by rly. N. of Khartum and 811 m. S. of Cairo. A few miles S. is the second cataract.

Wady Musa OR **RIVER OF MOSES.** Stream of Transjordan. It is said to have originated when Moses struck the rock (Num. 20, vv. 7-13). On it are the ruins of Petra (q.v.).

Wafd. Egyptian political party. Nationalist in outlook and suspicious of the British connexion with Egypt, the Wafdists first became prominent by winning the elections of 1926. Through the rest of King Fuad's reign they were alternately in and out of office, under the leadership of Nahas Pasha (q.v.). Their party uniform was the blue shirt, until King Farouk in 1938 made private armies illegal. Nahas and Wafdists gained an overwhelming electoral success in 1942, but gave wholehearted support to Great Britain during the Alamein campaign. They went out of office in 1944 and boycotted the elections of 1945; but secured 225 out of 319 seats at the 1950 elections. See Egypt: History.

Waffer. Adhesive disk for fastening down envelopes, holding papers together, or as a basis for or in the place of seals. In medicine wafers of paste are used to enclose powders for ease in swallowing. The ecclesiastical wafer used in the Holy Eucharist consists of a thin disk of unleavened bread (see



Wadham College, Oxford. Quadrangle and hall, over the entrance of which are figures of the founders and of James I
Frith

Host). From this use has arisen the term wafer for any thin biscuit, e.g. one eaten with ice cream.

Wager (Fr. *gager*, to pledge). Something that is pledged or staked, as in the phrase wager of battle, when life is the stake. The word now used chiefly as a synonym for a bet (see Betting). Wager of law was an Anglo-Saxon method whereby a defendant might discharge himself of the plaintiff's claim by swearing to his innocence. It was abolished in 1833.

Wages. Payment made to an employee for placing his skill and energy at the disposal of an employer, for him to use at his dis-

cretion within the terms of a contract of service. The term wages logically includes salary, fee, commission, stipend, etc.; but it usually denotes the remuneration of non-clerical workers, most of whom are paid weekly.

Wages may be stated as (a) rate for each unit of time (hour, day, week, month, year); (b) rate for each unit of work done (piecework wages); (c) rate for each unit of work varying according to the amount of work done (output bonus, premium bonus, differential piece-rate, etc.). In addition, by custom or express agreement special rates of wages may exist for work done on any day in any week in excess of a stated number of hours or that done on specified days (Sunday, bank holidays, etc.). Such special work is called overtime; the remuneration, overtime rates (pay).

The actual rate of wages may be determined by individual agreement between the worker, e.g. a gardener, chauffeur, night-watchman, and the employer; but most contracts of employment of wage-earners conform to a pattern decided by a statutory body (e.g. a wages council) or by agreement between trade unions and employers' federations. Wages rates of more than 10 million workers in the U.K. are determined by agreements with trade unions which normally define overtime and the rates of pay for it (time and a quarter, time and a half, double time, etc.) and provide a minimum hourly rate that shall be paid to a worker engaged on piecework who fails to attain a rate of output entitling him to a larger payment. Many piece-rates are associated with a standard time or a standard output: thus, if the standard time for a job is 4 hrs. and the worker completes it in 2½ hrs., he may be credited with 50 p.c. of the time saved (1½ hours), and thus receive for his 2½ hrs. work wages for 3½ hrs. Some wage agreements vary rates according to, e.g., the price of pig iron, and many are based to some extent upon the govt. index of retail prices.

Under the Truck Acts, 1831 to 1896, wages are payable in money, not in goods, and a stipulation concerning the place or the manner in which wages are to be spent is illegal. The employer is responsible for stamping the employee's insurance card and may deduct the employee's insurance contribution; similarly, under P.A.Y.E., he is responsible to the inland revenue authorities for the employee's pay-

ment of income tax on his wages ; must maintain records showing the gross wages, the tax due, and the tax deducted ; and must send details to the inspector of taxes and furnish periodical tax certificates to the employee. *See* Economics ; Minimum Wage ; Piecework ; Trade Board ; Wages Council.

Wages Council. Body set up in the U.K. in 1945. The Wages Councils Act, 1945, transformed the trade boards into joint wages councils and gave the minister of Labour authority to make the findings of a wages council binding upon all the employers in the industry concerned. It also empowered the minister to establish wages councils in trades or industries where voluntary machinery was not adequate or was likely to become inadequate. He could appoint a commission of inquiry to consider the establishment of a wages council in any industry where, in his opinion, conditions required it.

Wages councils exercised in two main respects wider powers than those of the trade boards. They could recommend the fixing of statutory minimum remuneration (instead of minimum rates of wages), and make recommendations with regard to paid annual holidays beyond one week. A wages council includes representatives of employers and workers with not more than three independent persons chosen by the minister. *See* Trade Board.

Wagga Wagga. Town of New South Wales, Australia. It stands on the Murrumbidgee, 310 m. by rly. S.W. of Sydney, where the main line from Melbourne crosses the river. It is the centre of a pastoral and mining dist. Pop. 7,400.

Wagner, (WILHELM) RICHARD (1813-83). German composer. Born at Leipzig, May 22, 1813, the youngest son of a municipal official, he was mainly self-taught, and afterwards studied music at Leipzig. In 1833 he was appointed chorus-master at the theatre of Würzburg, and during the next few years held small posts at Magdeburg, Königsberg, and Riga ; in 1839 he went to Paris and stayed till 1842, when he removed to Dresden, and was appointed Hofkapellmeister. Driven from Germany by the political upheavals of 1849, he passed the next twelve years in exile in Switzerland, England, Italy, and France ; from 1861 to 1864 he was mainly in Vienna and Mainz, in increasing financial distress, from which he was relieved by the gift of a pen-

sion from Louis II of Bavaria. From 1864 he was at Munich, and subsequently in Switzerland till 1872, when he removed to Baireuth (*q.v.*), which remained his home till his death, at Venice, Feb. 13, 1883. He was twice married, first to Minna Planer, an actress, and secondly to Cosima von Bülow, daughter of Liszt.

The great bulk of Wagner's music was written for the stage. His operas are *Die Feen*, 1833 ; *Das Liebesverbot*, 1835-36—these two were not published during his lifetime ; *Rienzi*, 1838-40 ; *The Flying Dutchman*, 1840-41 ; *Tannhäuser*, 1844-45 ; *Lohengrin*, 1846-48 ; *Der Ring des Nibelungen*, a tetralogy consisting of *Das*



Rheingold, 1853-54, *Die Walküre* (*Valkyrie*), 1854-56, *Siegfried* (begun in 1857, abandoned for some years, and completed 1869), and *Götterdämmerung*, 1870-74 ; *Tristan and Isolde*, 1857-59 ; *The Mastersingers of Nuremberg*, 1862-67 ; and *Parsifal*, 1877-82. He also composed some orchestral music, of which the only important pieces are a *Faust* overture and the *Siegfried Idyll*, a serenade to his second wife on the birth of their son ; a handful of pianoforte and choral pieces of slight value ; and some songs to French and German words. His literary output is considerable ; he was his own librettist, and also wrote on philosophical aesthetics and other musical subjects.

Wagner developed his real powers comparatively late in life ; in general, it may be said that all his mature work was written after his fortieth year. To this rule there are exceptions, such as some of the French songs of 1839, the overture

and sea-music in *The Flying Dutchman*, and some portions of *Tannhäuser* and *Lohengrin*, particularly the prelude to the latter and the *Venusberg* music in the former—though in its original shape this is still a pale forecast of the Paris version of 1860. But from *Das Rheingold* onwards there is, whatever the passing inequalities, an extraordinary advance both in inspiration and in technique ; and it is in virtue of the splendours of his later work that Wagner ranks among the supreme composers. During his lifetime he suffered more than any other musician in history the extremes of both abuse and adulation. Since his death the proper perspectives have become clearer. Incomparably greater as a musician than as anything else, he failed to realize his elusive idea of the necessary interaction of the arts, but his all-round influence has been colossal. His vast musical conceptions flowed with equal ease in channels so diverse as the love-passion of *Tristan and Isolde*, the warm-hearted comedy of *The Mastersingers*, the tragedy of *Götterdämmerung*, and the mysticism of *Parsifal* ; and in the *Siegfried Idyll* he showed an equally wonderful power of painting a small canvas with the utmost sympathy and grace. Harmony, orchestration, and perhaps most of all counterpoint, were enormously advanced by him ; and no other composer has done so much to destroy that selfish predominance of the solo singer that was formerly so prevalent, particularly in the operatic world.

His son *Siegfried* (1869-1930) was known as a conductor, and married *Winifred Williams* (b. June 23, 1897), who directed the Baireuth festival during the Hitler regime. In 1947 she was sentenced to 450 days' special labour service and the loss of 60 p.c. of her fortune. Ernest Newman's exhaustive four-vol. biography of Wagner (1933-47) has superseded all other works in English.

Ernest Walker, D.Mus.

Wagner von Jauregg, JULIUS. Austrian psychiatrist, considered in this work as Jauregg.

Wagram. Village of Austria. It stands on the Rorsbach, 11 m. from Vienna. Here a battle was fought between the French under Napoleon and the Austrians under the archduke Charles, July 5 and 6, 1809. Napoleon advanced from Vienna against the Austrian positions at the village. The first French attack in the afternoon of

the 5th was repulsed, and on the next morning the Austrians took the offensive. They succeeded in forcing back the French for some distance, but in a counter-attack the French caused the Austrians to withdraw, though the victors were too exhausted to follow. The French lost about 30,000 out of 180,000 engaged, and the Austrians 25,000 out of 130,000.

Wagtail (*Motacilla*). Genus of insectivorous birds. It is allied to the pipits, but distinguished by the



Wagtail. Black-and-white pied wagtail, a sprightly, insectivorous bird

greater length of the foot-bones, wings, and tails. Wagtails are restricted to the Old World, except that the blue-headed species has been found in Alaska. They are running birds. Three species breed regularly in the British Islands: the pied wagtail (*M. alba yarelli*), the grey (*M. cinerea*), and the yellow (*M. flava flavissima*). In addition the white wagtail (*M. alba*) visits Great Britain in autumn and spring. The blue-headed wagtail (*M. flava flava*) is a rare visitor to the E. and S. coasts. The pied wagtail or dish-washer is a sprightly black-and-white bird. The white wagtail is similar, but its upper parts are grey instead of black. The grey wagtail is blue-grey above. See Eggs colour plate.

Wahabi or **WAHHABI**. Name of the members of a Mahomedan sect. Founded early in the 18th century by Mahomed ibn Abdul Wahhab (1704-92), the son of a Nejd shepherd, it sought the simplicity of early Islam. It deprecated pilgrimage to holy places, invocation of saints, luxury in dress, and sepulture, and prohibited tobacco.

This reform was embraced in 1742 by Mahomed ibn Saud. He and his successors, making Daraiyeh their capital, gradually established dominion over Arabia. During 1801-04 the holy places at Kerbela, Mecca, and Medina were despoiled. In 1811 Mehemet Ali, viceroy of Egypt, organized an expedition which, after desperate struggles, broke the Wahabite power in 1818, its chief, Abdulla, being executed at Constantinople. In 1824 his son re-

established the sect at Riyadh, its present capital.

Before the old Wahabite empire fell its tenets reached N. India. Sayyid Ahmed (1782-1831) embraced them and fought the Sikhs, but the sect is now of dwindling importance. See Senussi.

Wahsatch Mountains. Division of the Rocky Mts., U.S.A. It extends from the S.E. part of Idaho southward to the S.W. part of Utah, constituting the E. border of the Great Basin. Largely covered by forests of pine, it is a rugged range, having a mean elevation of about 10,000 ft., with peaks exceeding 12,000 ft. The Uinta mts., an E. branch, rise to 13,688 ft. in Gilbert Peak.

Wahuma (Northerners). Swahili form of the name of the Hima people, mostly in the Uganda protectorate, British E. Africa. Of Hamitic descent, in the Tanganyika Territory, they are the more negritized Batusi. See Bahima.

Waif. Term applied to a homeless person, particularly to a child abandoned by its parents. The Church of England Incorporated Society for providing Homes for Waifs and Strays (now C. of E. Children's Society) was established, 1881, in London, to rescue neglected or crippled children and care for them in special homes. Its headquarters are at Old Town Hall, Kennington Road, S.E.11.

Waihi. Town of North Island, New Zealand. It is situated in the E. of Ohinemuri co., has rly. connexions with Thames and Auckland, and is the centre of a gold-mining area. Pop. 3,916.

Waikato. River of North Island, New Zealand. Rising in Ruapehu, it flows through L. Taupo, and N.W. through Auckland prov. into the Tasman Sea, 25 m. S. of Manukau Harbour. Its length is 220 m.

Wailing Wall. Portion of the Temple of Herod in Jerusalem which escaped destruction by the Romans in A.D. 70. It is the S.W. section of the Turkish mosque, Haram esh Sherif, and is about 60 ft. high. Here devout Jews have been accustomed for centuries to gather on Fridays at sunset and on eves of feasts and fasts to lament the departed glory of Israel. Incorporated as it is in a Muslim building, it has been the scene of disputes, sometimes violent, between Jews and Muslims over its use and care. See illus. p. 4681.

Waimate. Town of South Island, New Zealand. It is 130 m. S.W. of Christchurch by rly., in Canterbury prov., and its industries include flour and saw mills.

Wain, Louis William (1860-1939). British artist. Born in London, Aug. 5, 1860, he was



Louis Wain, British artist

educated by the Christian Brothers, and studied at the W. London school of art. In 1882 he joined the Illustrated Sporting and Dramatic News, and

was later attached to the Illustrated London News and the New York American. His drawings were at the height of their popularity at the turn of the century and for the following decade. The greater part were humorous representations of cats and dogs, especially the former. His work in this line in many magazines, on picture postcards, in posters, and in Louis Wain's Annual, dating from 1901, made "Louis Wain's cats" familiar to everyone. He also took a



A Louis Wain cat

practical interest in their welfare, becoming president of the National Cat Club, and a committee-member of the society for the protection of cats. Unfortunately he flooded his own peculiar market and in later life had to

face comparative poverty. Also

his last years were clouded by poor

health. He lived until July 4, 1939.

Wainewright, Thomas Griffiths (1794-1852). British poisoner. Born at Chiswick, he became an art critic and was an associate of Hood, De Quincey, and Lamb. Left an annuity of £200, in 1826 he forged an order upon the Bank of England to obtain the capital sum. In 1828 he went to live with a bachelor, uncle, Griffiths, who died suddenly and left Wainewright all his property. In 1830 his mother-in-law, who had objected to his insuring the life of her unmarried daughter, died as suddenly; immediately afterwards the daughter Helen, now insured for several thousand pounds, also died. The insurance company disputed Wainewright's claim, and he fled to Boulogne in 1831. On his return in 1837 he was arrested for the forgery of 1826, and transported for life to Van Diemen's Land. He died in hospital at Hobart.

There is little doubt that Wainwright poisoned his uncle, mother-in-law, and sister-in-law with strychnine, but legal proof was lacking. Dickens has drawn a picture of Wainwright under the name of Slinken, in *Hunted Down*, and in Bulwer Lytton's *Lucretia the poisoner* appears as Varney. W. C. Hazlitt edited Wainwright's *Essays and Criticisms*, with memoirs, 1880. Wilde wrote of him in an article, *Pen, Pencil, and Poison*. Consult also *Lives of Twelve Bad Men*, T. Seccombe, 1894.

Wainfleet. Former market town of Lincs, England. In the parts of Lindsey, it is on the railway, 18 m. N.E. of Boston. The river Steeping is noted for angling. There is an ancient butter cross. A grammar school was established here in 1484 by William of Waynflete, founder of Magdalen College, Oxford. The town once had its own token coinage, known as the Waynflete halfpenny. Pop. 1,322.

Wainganga. River of the Madhya union, India. It is a tributary of the Praluta, itself a tributary of the Godavari. Rising near Seoni, it flows at first due N., then E., and then almost due S. across the Nagpur plain. Rice and sugar-cane are the chief crops in the valley, the Kohlis and Ponwars being capable cultivators. The lower valley is being colonised as irrigation works are being extended. Length, 350 m.

Wainscot. In joinery, a special quality of oak used for panels to cover the whole or part of a wall surface, hence the panels themselves used for this purpose. The term is derived from the Dutch *wagenschot*, the name of an oak species grown in Germany, at one time exported through Holland.

Waitangi. Village of North Island, New Zealand, a few miles inland from the Bay of Islands. Here in 1840 the Maori agreed to a treaty by which they accepted Queen Victoria's overlordship.

Another Waitangi is the chief town of the Chatham Is., 530 m. S.E. of New Zealand, to which they belong.

Waits. Term now applied to Christmas street musicians. In the 14th and 15th centuries the waits were watchmen, who sounded the hours on some musical instrument. In the 16th and 17th centuries waits were employed by most corporations, and appear to have been minstrels rather than watchmen. The London waits wore blue gowns and silver collars, and played their instruments at the lord mayor's

show, and at City banquets. In the 18th and 19th cents. their musical functions were taken over at Christmas by the watchmen, and by private performers. See *Carol*.

Waiver. In English law, the non-enforcement of a legal right in such circumstances that the court will infer an intention to give up the right altogether. Consideration may be necessary before a waiver is effective.

Wakamatsu. Town of Japan, in the island of Honshu. It is 60 m. S.E. of Niigata, on a coast-to-coast rly. line. It has a state works for producing steel, iron, steel rails, and plates, and an important lacquer industry. In the Satsuma rebellion of 1868 the city was razed to the ground. Pop. 58,517.

Wakatipu. Lake of South Island, New Zealand. One of the most beautiful of the Cold Lakes in the Alpine region, Otago prov., it is 1,016 feet above sea level, 1,242 feet deep, and 25 m. long, being chair-shaped. The outflow is by the river Kawarau to the Clutha.

Wakayama. Town of Japan, the capital of Wakayama prefecture of Honshu Island. It stands on Kii Strait, the E. entrance to the Inland Sea, and is connected by rly. with Kyoto, Kobe, and Osaka. Trade in cotton is carried on in normal times. Pop. 112,560.

Wake. Annual church vigil, also the all-night watching by a corpse before burial. The church wake was an all-night service commemorating the completion or dedication of a church, and was usually held on the patron saint's day, or on the Sunday after the day of dedication. Booths were erected in the churchyard for the supply of food and drink on the following day, which was a holiday, and the wakes soon became little more than uproarious fairs. Lancashire was long noted for its wakes, and the Bradford wakes were known as tides. The corpse wake is apparently of Celtic origin, and survives in Ireland. It consists in mourning the dead person, and reciting stories of his life. Candles

are lit round the bed. (See *Burial Customs*.) Annual holidays taken together by workers in towns of Lancashire are called wakes.

Wakefield. City and co. bor., and capital of the W. Riding of Yorks, England. It stands on

the Calder, 9 m. S. by E. of Leeds, and is well served by road, rly., and water. In 1888 the parish church of All Saints became the cathedral church of the new diocese of

Wakefield. Its eastward extension, built as a memorial to the work of the first bishop (Dr. Walsham How), was consecrated in 1905. The cathedral is well-known for its fine spire. Other buildings include the town hall, county hall, administrative buildings of the county council, and the sessions house. On the old bridge over the Calder stands the chantry chapel of S. Mary, restored in the 19th century. The grammar school was founded in 1591.

Wakefield is an industrial centre but has many advantages of a country situation. Industries include woollen manufacture, worsted spinning, chemical works, wire-drawing, engineering and machine-tool works, sheet metal working, boiler-making, and coal mining. Wakefield was of some importance in the Middle Ages, and in the 16th century a centre of the cloth trade. In 1848 the town was granted its charter as a mun. bor., to be created a city in 1888. Co. bor. status was conferred in



Wakefield arms



Wakefield, Yorkshire. Cathedral church of All Saints, enlarged from the 15th century parish church
The Wakefield Express Series

1914. It had its own M.P. from 1832; it now gives its name to a bor. constituency. Market day, Fri. Pop. est. 58,040.

Wakefield, BATTLE OF. Fought between the Yorkists and the Lancastrians, Dec. 30, 1460. Richard of York was at one of his strongholds, Sandal Castle, near Wakefield, when he was attacked and defeated by a host gathered by Margaret, queen of Henry VI. Richard, his son Rutland, Salisbury (father of Warwick, the King-maker), and many others were slain.

Wakefield, CHARLES CHEERS WAKEFIELD, VISCOUNT (1859-1941). British business man and philanthropist. Born Dec.



Viscount Wakefield, British business man

12, 1859, he studied at Liverpool Institute. In 1899 he inaugurated the vast organization of C. C. Wakefield and co., makers of Castrol oil, with himself as governing director. He received a knighthood in 1908, baronetcy 1917, barony 1930, and viscountcy 1934. In 1915 he became lord mayor of London. When he died, Jan. 15, 1941, there was no heir to the title. Wakefield was known to the public for his practical interest in hospitals and charities, enthusiasm for speed records by land and air, and knowledge of pictures. He purchased and endowed Talbot House at Poperinghe; gave sums of several thousands to the Imperial Institute, Tower Hill improvement trust, Bridewell and Bethlem hospitals; guaranteed £50,000 to the British Museum for purchase of the Codex Sinaiticus; gave to the nation Nelson's log-book, the Thomas à Becket cup, the Armada Jewel, Newton's papers, and portraits by Orpen and Sargent; helped to finance flights by Sir Alan Cobham, J. A. Mollison, and Amy Johnson; owned the three speedboats Miss England, in which Segrave raced; and awarded the Wakefield gold trophy for speed. He wrote a helpful book, *On Leaving School*, giving advice on choosing a career.

Wakefield, EDWARD GIBBON (1796-1862). A British colonial statesman. Born in London on May 20, 1796, and educated at Westminster and Edinburgh high school, he was attached to the British embassies at Turin, 1814-16, and Paris, 1820-26. For ab-

ducting an heiress in 1826 he was imprisoned, and a diplomatic career was ruined. In 1830 he wrote a book on capital punishment, which helped towards amelioration of the English criminal law. Having made a close study of colonization, he was secretary to the 1st earl of Durham in Canada, 1838; and as manager first of the S. Australian co. and then of the New Zealand Association, inspired the annexation of these territories. Besides writing his *View of the Art of Colonisation*, 1849, Wakefield edited Smith's *Wealth of Nations*. He died at Wellington, N.Z., May 18, 1862. There are studies by R. Garnett, 1898; A. J. Harrop, 1928; I. O'Connor, 1929.

Wakefield, GILBERT (1756-1801). British scholar. Born at Nottingham, Feb. 22, 1756, and educated at Jesus College, Cambridge, he took orders, but soon adopted Unitarian doctrines. An advocate of the principles of the French Revolution, he came into conflict with the authorities in 1798, for seditious writing in a reply to the bishop of Llandaff's defence of Pitt and his policy, and was imprisoned for two years. Wakefield was a classical scholar of great repute who published editions of Horace, Bion and Moschus, and Lucretius. His other works include *Internal Evidence of the Christian Religion*, 1789; and *An Examination of Thomas Paine's Age of Reason*, 1795. He died Sept. 9, 1801.



Gilbert Wakefield, British scholar
After Green

Wake Island. Island of the Pacific Ocean. Situated in about 166° E. long. and 19° N. lat., it is one of a group of three islands, the other two being Wilkes and Peale, and is approx. 3,000 m. E. of Hong Kong and 2,000 m. W. of Hawaii. The group is 4½ m. long and 1½ m. wide, Wake Island covering 1 sq. m. A U.S. possession since 1898, it remained uninhabited and undeveloped until 1935, when an airfield was established as a staging point for Pan-American Airways. Wake Island was garrisoned by 400 marines and 12 fighter aircraft. On Dec. 8, 1941, the Japanese attacked, but desperate resistance prevented capture until Dec. 22. The Japanese lost a light cruiser, a destroyer, and several aircraft. The island was developed by them as a naval and air base for attacks on Allied convoys. The

first U.S. attack on the occupied island came on March 25, 1942, when warships shelled Wake and carrier-borne planes dropped 219 bombs. There were a number of other attacks by land-based and carrier-borne aircraft, but the most violent assault was on Oct. 5 and 6, 1943, when a strong naval force bombarded Wake, and carrier-borne and land planes dropped 320 tons of bombs. The island remained in Japanese hands until after the general surrender, a U.S. force taking the local surrender Sept. 4, 1945.

Wake Robin, CUCKOO PINT, OR LORDS AND LADIES (*Arum maculatum*). Perennial herb of the family Araceae. A native of Europe and N. Africa, it has a tuberous rootstock, renewed annually, from which are produced the large, spear-shaped leaves, often blotched with purple-black. The short flowering stem is surmounted by a large cowl-like wrapper (spathe), yellow-green with a purple edge, and sometimes spotted with the same colour. Within this is the thick, dull purple, club-shaped spadix, around the lower half of which are clustered the simple flowers. The lowest of these are pistils, the upper stamens. The two groups are separated by a ring of hairs, and the stamen cluster is roofed by other hairs, which partially close the lower portion of the spathe. The pistils develop into fleshy scarlet berries, which become conspicuous in autumn, when the spathe has withered. This whole plant is acrid and poisonous, yet, properly treated, the corms yield a nourishing starch called Portland arrowroot. See illus. under Botany.

Wakkerstroom. Town of the Transvaal, S. Africa. It is 18 m. by rly. W. of Volksrust, standing near the frontier of Natal at an alt. of 5,900 ft., and is an agricultural and administrative centre. It is partially surrounded by mts., which rise to 7,500 ft., and stands in a plain drained by the river Slang. Pop. est. 1,500. It is also the name of one of the dists. of the Transvaal, this having been formed in 1859.

Wakley, THOMAS (1795-1862). Founder of *The Lancet*. A native of Wembury, Devon, he was born

July 11, 1795.

Apprenticed to an apothecary, he studied medicine at the Borough hospitals, and in 1817 qualified for the Royal College of Surgeons. Estab-



Thomas Wakley, British surgeon

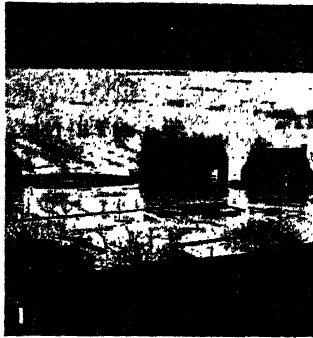
lishing a practice in Regent Street, London, in 1823 he founded The Lancet, in which he set himself to remedy various abuses in the medical world. M.P. for Finsbury 1835-52, Wakley died May 16, 1862.

Walbrook. Narrow thoroughfare of the City of London running S.W. from the Mansion House to Cannon St. It contains Wren's church of S. Stephen Walbrook, the cupola of which is said to have been a trial model for S. Paul's cathedral dome. Wren lived at No. 5 for a time. Roman remains were revealed when the street was destroyed and the church damaged by German bombs, Dec. 29-30, 1940. Rebuilding began in 1950.

Walcheren. Island of the Netherlands, in the prov. of Zeeland. About 12 m. from W. to E., 10 m. from N. to S., it lies in the Schelde estuary, W. of N. and S. Beveland, and is connected with the mainland at Woensdrecht by a rly. which runs across S. Beveland. Its motto, *Luctor et Emergo* (I struggle and emerge), is highly appropriate to an island nearly all of whose surface is below sea-level, protected by dykes. Before the Second Great War it was a famous orchard country, and the good soil grew excellent crops of cereals and sugar beet. Cattle were also reared, and dairy products made. Flushing, still out of service at the end of 1948, was a flourishing port. The capital is Middelburg (*q.v.*); Veere, Domburg, and Westkapelle are fishing ports.

During the French occupation of the Netherlands a British expedition consisting of 264 ships of war, 352 transports, and more than 30,000 troops, under Lord Chat-ham, was dispatched in 1809 to seize Walcheren, possession of which gives command of the Schelde estuary, and thus of the entry to the port of Antwerp. After the landing on July 30 Flushing was invested and fell on Aug. 16. The intended attack on Antwerp was abandoned; but 15,000 men were left to garrison Walcheren. These soon succumbed to malaria, caused by the mosquitoes of the island, to which the inhabitants had become immune; some 7,000 died and half the remainder, brought home during Dec., were permanently incapacitated.

During the Second Great War, after bombing Middelburg, Flushing, and Veere, the Germans gained control of Walcheren in May, 1940. The need to open Antwerp led the Allies in 1944 to decide to capture Walcheren. On Oct. 3, after a warning to the inhabitants, R.A.F.



Walcheren. War damage and reconstruction on this island of the Netherlands. 1. Part of the floods which covered large areas of the island, following the breaching of the sea dykes. 2. Town Hall of Middelburg partly destroyed in 1940, showing reconstruction work in progress. 3. Rebuilding the old church of Zoitelande, one of the victims of the sea water

bombers attacked the sea dyke at Westkapelle with 12,000-lb. bombs, breaching it for 120 yds. and letting the sea into large areas of the island, including Westkapelle itself. On Oct. 7 the dykes on either side of Flushing were breached, German strongpoints in the area being marooned or flooded. But the Germans fought stubbornly—a captured order of the day of Oct. 7 said, "We must hold the Schelde fortifications at all costs to the last man. It is a decision for the future of our people." On Nov. 1 British and Canadians advancing from the mainland secured a bridgehead across the causeway connecting S. Beveland with Walcheren; troops of the 52nd (Lowland) div. (then serving with the Canadian 1st army) crossed the Schelde from Breskens (captured Oct. 22) to Flushing, much of which was in their hands by nightfall; and a commando force of Royal Marines from Ostend attacked at Westkapelle, meeting much heavier fire from German batteries at Domburg than had been anticipated, in view of severe preliminary aerial bombardment; but they effected a

landing, capturing Domburg in falling snow on the 3rd.

Flushing was cleared, except for snipers, by Nov. 4; the port and its installations had been wrecked by the Germans. Middelburg and Veere were occupied on the 7th; the troops advancing to take them fought through the worst terrain encountered in W. Europe, sometimes waist deep in mud. The last German troops were taken off Walcheren on Nov. 10 and the shores of the W. Schelde were clear.

For a year the tides washed over Walcheren, rising and falling in the flooded houses. After the sealing of the breaches in the sea dykes, with the help of Mulberry harbour concrete pontoons, in Oct., 1945, pumping out of salt water began. The land proved less badly impregnated with salt than had been feared; but every tree was dead, and the soil had been shifted so that areas formerly fertile had become poor, while some poor areas had been improved. A harvest of sorts was raised already in 1946; work on replanting trees, rebuilding houses, etc., and replacement of lost stocks proceeded steadily.

Waldeck. Former state of Germany. It was ruled by counts 1139-1712, thereafter by princes. In 1918 it became a republic associated with Prussia, with which it was incorporated 1929. Situated between Westphalia and Hesse-Nassau, it had an area of 433 sq. m., its pop. being 58,000. The climate of the dist. is inclement, and chief crops from the infertile soil are oats, with some rye, potatoes, and flax. The capital was Arolsen (pop. 3,000).

Waldeck-Rousseau, PIERRE MARIE RENÉ ERNEST (1846-1904). French statesman, born at Nantes, Dec. 2, 1846. He became a barrister and mayor of Nantes, 1870. Entering the chamber in 1879, he was minister of the interior, 1881-85. He opposed Boulanger, 1889, defended de Lesseps in the Panama trial, 1893, unsuccessfully contested the presidency of the republic, 1894, and became premier, 1899, his administration being marked by the revision of the Dreyfus trial, 1899. His most important measure was the Associations Act, 1901, which provided a foundation for the French trade union movement. He resigned in 1902, dying at Corbeil, Seine-et-Oise, Aug. 10, 1904.

Waldegrave, EARL. Title borne by the Waldegrave family since 1729. The founder of the family was Sir Edward Waldegrave (d. 1561), a royalist baronet who was M.P. for Sudbury. His grandson Henry was created a baron in 1686, and on his death, three years later, was succeeded by his son James, who was ambassador in Vienna and Paris and was made an earl in 1729. His eldest son, James, who succeeded as 2nd earl in 1741, held several court appointments, and was governor to George III when prince of Wales. On his death in 1763 the title passed to his brother John, and through his descendants to Geoffrey Noel (b. Nov. 21, 1905), the 12th earl. The country seat is at Chewton House, near Bath, and the eldest son is known by the courtesy title of Viscount Chewton.

The family of Waldegrave also bears the title of Baron Radstock, conferred in 1800 upon William (1753-1825), 2nd son of the 3rd earl, for his naval services. Montague (b. 1867) became 5th baron in 1934. *Pron.* Wallgrave.

Waldemar OR VALDEMAR. Name of four kings of Denmark. The third of this name (1314-64) came to the throne in 1326 in succession to Christopher II, but was deposed after four years. The others receive separate entries.

Waldemar I (1131-82). King of Denmark, 1157-82, known as the Great. Son of Canute Lavard and the Russian princess Ingeborg, he was elected king after the country had passed through 120 years of chaos following on the death of Canute the Great. He finally defeated and forcibly converted the pagan tribes of the Baltic shores, suppressed piracy, and left the country in a state of great prosperity with the feudal system well established. His chief minister was Bishop Absalon.

Waldemar II (1170-1241). King of Denmark, 1202-41, known as the Legislator. He was a younger son of Waldemar I, and on Nov. 12, 1202, succeeded his brother, Canute VI, on the throne. He brought under his rule all the German and Wend territories along the Baltic, and in 1219 Estonia as well. In this last campaign, according to a legend, he was saved by the descent from heaven of a red banner with a white cross (the Danish flag). In 1223 he was captured by one of his vassals and taken to Germany, and released only after paying a heavy ransom and surrendering his German conquests. His attempt to recover these losses was defeated at Bornhöved, July 22, 1227, which ended Danish domination of the Baltic. Thereafter Waldemar devoted himself to the codification of the laws. He died March 21, 1241.

Waldemar IV (1320-75). King of Denmark, 1340-75, known as Atterdag (Again a Day, his maxim being that a man should bide his time.) He was the youngest son of Christopher II, and when elected king his realm consisted of little more than N. Jutland. During 1343-47 he recovered Copenhagen, Zealand, and the southern islands, and in 1346 he sold Estonia to the Teutonic Order. Conquest of Gothland in 1361 led to a war with Sweden and the Hanse towns which was closed by an ignominious peace at Stralsund in 1370. Waldemar regained the authority of the crown by calling in demesnes and rents, and issued a famous charter at Kalundborg in 1360. He died Oct. 24, 1375.

Walden OR LIFE IN THE WOODS. Volume of papers (1854) by Henry Thoreau. Mostly written during his stay on the shore of Walden Pond, Concord, Mass., they express his philosophy of existence, exalting the untrammelled natural life and the joy of contemplation, in a style that is often poetic.

Waldenses OR VAUDOIS. Religious sect founded by Peter

Waldo of Lyons in the 12th century. Their doctrines were based upon a literal interpretation of the moral precepts of the Bible, to which the fundamental objections on the part of the authorities were that they placed the moral law as interpreted by themselves above the civil law.

The sect was widespread in Provence, Piedmont, and the intervening mountain districts. They were subjected to periodical persecutions, and in the 16th century became attached to the Calvinistic branch of the reformers. The persecution of the Vaudois subjects of the duke of Savoy in 1655 induced Cromwell to intervene, an episode commemorated in Milton's sonnet: *Avenge, O Lord, thy slaughter'd saints, whose bones lie scatter'd on the Alpine mountains cold.*

Active persecution ceased in the 18th century, but the Waldenses continued to be excluded from civil rights till 1848. A recognized Protestant church, the Waldenses are still vigorous. In Italy they made progress in the early 20th century, despite bitter opposition from the R.C. church.

Waldstein, FERDINAND ERNST GABRIEL, COUNT (1762-1823). German aesthete. This youngest son of the Count Waldstein and Wartemberg von Dux was born March 24, 1762, and from 1786 belonged to the German Order until he left it at 50 to marry. At Bonn in 1787 he became a close friend of Beethoven, who dedicated to him the famous piano sonata, op. 53. The count also suggested the air on which twelve variations were composed in 1792. He died Aug. 29, 1823. *Pron.* Valt-shtine.

Waldteufel, EMIL (1837-1915). French composer. Born of Alsatian stock at Strasbourg, Dec. 9, 1837,



Emil Waldteufel,
French composer

he later settled in Paris, where he studied the piano and composition at the conservatoire. Employed at a piano factory, he was in 1865 appointed pianist to the empress Eugénie. His first waltzes, *Joies et Peines*, and *Manola* (published at his own expense), proved so popular that he devoted himself exclusively to writing hundreds of others, the best-known being the *Skaters Waltz* and *Estudiantina*. He died in Paris, in Feb., 1915. *Pron.* Valt-toyfel.

WALES AND THE WELSH

See the articles on the Welsh counties, towns, mountains, and rivers; also Celt. and biographies of eminent Welshmen. See also England; English History, etc., for matters in which the affairs of England and Wales are intermingled, and for various maps

Wales forms a peninsula in the west of the island of Great Britain. With a very irregular coast-line it is bounded by the sea on the N., W., and S., and its land frontiers are the English counties of Cheshire, Shropshire, Hereford, and Monmouth.



Wales arms

Wales is in the main a land of mountains. The central ridge begins in the N. at Snowdon, the highest peak S. of Scotland, and follows the curve of the coast of Cardigan Bay almost to St. David's Head; W. from Snowdon it forms the backbone of the Lleyn peninsula. W. of the main ridge short streams drain to Cardigan Bay, the chief being the Teifi, Ystwith, and Dovey.

This district, a sparsely populated one, caters for tourists on its shores and in its mountain hamlets; rears sheep within stone-walled scraps of rough pasture, and fattens swine for the markets of the English midlands. Cardigan, Lampeter, Aberystwyth, Barmouth, and Portmadoc are connected by rly. lines, with few connexions E. to more populous areas. N.E. the valleys lead to the N. coast, the Conway, Clwyd, and Upper Dee being the chief. This district includes the low island of Anglesey. The modern rly. and the earlier road to Holyhead, the port for Dublin, avoid the ridges. The coalfield of Flint in the E. is responsible for small industries. Bala is the largest lake. The Dee leads E. to the Cheshire Plain.

From the main ridge N.E. of Tregaron a water-parting goes first S., then E. along the Brecknock (Brecon) Beacons, and S.E. to Newport. This is the limit of the area drained to the Bristol Channel to include S. Wales and W. Monmouthshire. The mountain valleys of the Taff, Neath, and Tawe, served by numerous rlys. which give connexion with the great coal port of Cardiff, lie within the S. Wales coalfield, one of the largest deposits of anthracite coal in the world. To the N. deposits of iron ore caused the growth of ironworks at Merthyr Tydfil.

S. of the highlands is the low, wide, fertile Vale of Glamorgan, a wide coastal lowland continued

across Swansea Bay in the Gower peninsula, and farther W. in the lowlands of Pembroke. The broad Vale of Carmarthen, the valley of the Towy, and the Pembroke lowlands are farm lands.

The Central Welsh uplands on the E. drain to the Severn estuary, across the English lowlands of Shropshire, Worcester, and Gloucester. From the central knot of Plynlimon the Severn and Wye, and farther S. the Usk, each with many small affluents, dissect the highlands of Montgomery, Radnor, and Brecknock; within Wales they are mountain torrents.

Few rlys. cross the bleak moorlands. Sheep-rearing is the main

occupation, and in Newtown and Welshpool are woollen factories.

Wales comprises twelve counties with a total area of 7,466 sq. m., of which Glamorgan occupies almost a ninth. The pop. (est. 1941) is 2,100,000, with more than half the people in Glamorganshire. The capital is Cardiff. Important industrial towns are Merthyr Tydfil and Swansea. Other urban centres with pops. of over 20,000 are Aberdare, Barry, Caerphilly, Gelliger, Liwchwr, Maesteg, Mountain Ash, Neath, Ogmore, Pontypridd, Port Talbot, and Rhondda (all in Glamorgan), Colwyn Bay and Wrexham (Denbigh), and Llanelli (Carmarthen). Rhyl, Prestatyn, Colwyn Bay, Llandudno, Llanfairfechan, and Bangor are holiday resorts on the N. coast, the last-named being a centre for exploring the Snowdon region. There is slate quarrying in the district.



Wales. Map of the principalities showing the railways and principal roads

Barmouth and Aberystwyth are holiday centres of the W. coast, and Tenby of the S. Llandrindod Wells and Builth Wells have been developed as small inland spas. The constituent colleges of the university of Wales are situated at Cardiff, Swansea, Bangor, and Aberystwyth.

In general the government of Wales is associated with that of England. In one or two matters, however—for instance, education—Wales and Monmouthshire have a distinct organization.

The patron saint of Wales is S. David. From its association with princes of Wales the country is frequently spoken of as the principality.

No survey of the Welsh people would be complete without a word on their great love of song, and on not only the many great soloists produced there but the many famous choirs.

GEOLOGY. Wales forms one of the ancient massifs of Britain around which lie younger strata of Mesozoic age. It forms the nucleus of an old land mass referred to technically as St. George's Land. The oldest rocks are those of Anglesey and St. David's Head which are Pre-Cambrian in age. In Anglesey they consist of gneisses overlain by ancient sediments and volcanics, all strongly folded and metamorphosed. In early Palaeozoic times the present site of Wales, together with N.W. England, S.W. Scotland, and Scandinavia, formed an elongated basin of deposition or geosyncline in which were deposited sediments, lavas, and volcanic tuffs of Cambrian, Ordovician, and Silurian age. These deposits were involved in the Caledonian mountain building movements at the end of the Silurian period; they were folded and locally changed to slates which are quarried in N. Wales. The denudation of the Caledonian ranges provided detritus which was washed down into lakes where it formed the coarse sediments of Old Red Sandstone or Devonian age. These deposits occur in the Welsh Borderland and in S. Wales. The Carboniferous sea then transgressed over the area, and in it were laid down the limestones which are found locally in Anglesey, at Gt. Orme's Head, in Denbigh, around the S. Wales coalfield, and in Pembrokeshire. In S. Wales this sea gradually shallowed and estuarine conditions became established during which the forests that went to form the S. Wales coal seams flourished.

These conditions terminated in another period of mountain building. These earth movements are considered to be responsible for the metamorphism of the coal in the S. Wales field from soft bituminous to anthracite; the grade of coal changes gradually as the field is crossed from S.E. to N.W. This folding, termed the Armorican system, only affected S. Wales. Similar folding occurred in S. Ireland, Cornwall and Devon, and thence through Kent it can be traced to France and Belgium. The Armorican Mts. were eroded away in the desert conditions which succeeded their formation, and their truncated folds can now be seen covered by nearly flat lying Mesozoic strata which dip gently outwards from the Welsh block. The rivers of S. Wales were probably initiated on this gently sloping surface and their original courses can in many cases still be recognized, though often they have been deflected by local erosion along soft beds. Wales was a centre of ice accumulation during the Ice Age, and the mountains of Snowdonia owe much of their beauty to glacial erosion. All the present mountains have been carved by river and ice erosion out of the roots of the much more ancient Caledonian and Armorican Mts., the fold systems of which are now visible in the cliffs of the present day peaks and shore.

LANGUAGE AND LITERATURE. Welsh or Cymric, a tongue of the Brythonic branch of the Celtic family, nearly related to Cornish and Breton, has been spoken in Great Britain for over 2,000 years. Divided into Early, Middle, and Modern Welsh, in each period it went through a long battle with a foreign tongue before attaining its further development. The first was with Latin, during the Roman occupation, which added many Latin words to its vocabulary. The second was with Norman-French, which affected its art of poetry and, in a less degree, its literary vocabulary. The third was the long struggle with English.

Compared with English, Welsh has more vocal cadence, its gutturals are harsher, its vowel sounds broader and more Italianate. The alphabet has 27 letters, including the digraphs ch, dd, ff, ng, ll, ph, th, but lacks j, k, q, v, x, and z. By the mutation of consonants initial letters are changed by the preceding sounds. The language is still spoken extensively, but along the English border, throughout Rad-

norshire, S. Pembrokeshire, and S. Glamorgan, and in W. Monmouthshire only a minority speaks Welsh.

The number of Welsh-speaking people in Wales has long kept just below the million. The spread of education, which for a while appeared to threaten the old tongue, has not decreased that figure. In addition, there are several Welsh-speaking communities in America.

Early Welsh Books

After the earliest fragments of written Welsh that we can trace, a few glosses and verses of the 9th and 10th centuries, the true beginnings are found in the "Four Ancient Books of Wales."

Of these, the Black Book of Carmarthen, so called from the Black Friars of that town, contains verse dialogues, religious pieces, and odes. The Book of Aneurin and the Book of Taliesin contain poetry of equal power, elemental and direct; and from the Red Book of Hergest comes the one medieval Welsh prose work that has captured the outer world, the *Mabinogion* (q.v.). Among the poems in these early anthologies, Aneurin's Gododin, a war-lament for the battle of Cattraeth, 603, strikes a great note.

The earlier bards often insist on the letter and lose the spirit of poetry. Not so three poets of the late 12th century, Gwalchmai, whose battle-song Gray translated; Owain Kyveillig, who wrote the noble lay of the Hirlas Horn; and Howel ab Owain Gwynedd, Welsh prince and true love-poet. The greatest poet was very nearly Chaucer's contemporary, Dafydd ab Gwilym. He responded, like Chaucer, to an artistic impulse felt throughout Europe, and his favourite verse is a Welsh variant of a Romance model. Wind and snow, sea and forest creatures, give him his themes, and his love-songs have still the vagabond instinct in them. His odes are in *cywydd* form—a couplet tied in a double knot of assonance and rhyme.

Dafydd had many imitators, good and bad. To him succeed two good poets Iolo Goch (d. c. 1405), Owen Glendower's bard, and Rhys Goch Eryri. Tudur Aled, a Franciscan friar, was a *cywydd* writer during the Wars of the Roses.

At the Carmarthen Eisteddfod, 1451, the rules of poetry were made strict. With Elizabethan times, the "free measures" in verse and a freer melody came into vogue. The first translators of the Psalms began, like William Middleton, with the "close measures" governed by the metrical system called *cyng-*

anedd, but Edmwnd Prys (1541-1624) used the freer verse and gained the ear of the people. Bishop Morgan's Welsh Bible, 1588, did for that tongue what Cranmer's Bible did for English. A new literature sprang up in its wake. Rhys Prichard (1569-1644) in his *Canwyll y Cymry* put plain doctrine into good verse; Morgan Llwyd, one of Cromwell's chaplains, wrote an allegory, *Llyfr y Tri Aderyn*, or Book of the Three Birds.

Huw Morus (1622-1709) was a Royalist who masked his politics in allegory, and excelled in love-songs and carols. Elis Wyn's *Bardd Cwsc*, or Sleeping Bard (1703), is a masterly prose allegory of this world, death, and hell, based on Quevedo's *Visions*. Among scholars, Theophilus Evans, author of *Drych y Prif Oesoedd* (Mirror of the Chief Ages), 1716, was a Welsh historian and strong Church partisan who wrote excellent prose. Of 18th century poets, Goronwy Owen (1722-69) carried on the classic tradition with individuality and command of his art. William Williams of Pantycelyn (1717-91), an inspired hymn-writer at his best, became the living voice of his people.

Modern Literature

The 19th century produced two lyric poets of genius. Ceiriog (1832-87) wrote the love-songs of every young lover, and his Alun Mabon is a mountain idyll familiar wherever Welsh is spoken; Islwyn (1832-78), of more religious mould, was a nature poet with an exalted vision of his country. Dr. Lewis Edwards (1809-87) was a scholarly and thoughtful essayist. Gwilym Hiraethog (1802-83) gained a national audience by his *Llythyrau Hen Ffarmwr* (Letters of an old farmer). The founding of the university of Wales gave a new impetus to Welsh literature, which owes much to the influence of Sir Owen Edwards (1858-1920) and Sir J. Morris Jones. Revival of interest in the *Eisteddfod* has been a stimulus to poetry, fiction, and folk drama, and a new school of poetry, cordial and imaginative within the limits of correct traditional technique, has many adept contemporary exponents.

Meanwhile, the movement to extend the teaching and use of the Welsh language in the schools has been increasingly successful. Over 30 p.c. of the pop. is now bilingual.

HISTORY. The people known to the English as Welsh (A.-S. *Waelisc*), a term applied by the Teutons

to Romanised foreigners, call themselves *Cymry* (anc. *Combrogēs*), i.e. fellow-countrymen. A dark, pre-Celtic population of the Mediterranean race has been successively conquered and modified by Goidelic and Brythonic Celts. The latter gradually imposed their speech on the whole country.

Roman and English Conquests

Despite the stubborn resistance of the Silures in the S.E. under Caractacus, the country was subdued by Rome, A.D. 51-78. After the Roman evacuation, Cunedda Wledig, a British prince from S. Scotland, established himself in the N.W. district of Gwynedd, and founded a dynasty, a member of which, Maelgwn, c. 515-547, ruled all Wales and Cumbria. The national church, founded before 300, produced in the 5th-7th centuries many notable men, like SS. David, Asaph, Deiniol, and Kentigern. It submitted to Rome about 768.

The English conquests drove many fugitives into Wales, which was severed from Cornwall and Cumbria by the defeats at Deorham, 577, and Chester, 613. Offa of Mercia protected his conquests by his dyke. Wales, although thus isolated, failed to unite, except for brief periods, owing in part to its tribal institutions and in part to its physical configuration. Harassed alike by Norsemen and English, and frequently at war among themselves, the Welsh princes acknowledged the overlordship of powerful English kings.

Two able princes, Rhodri the Great (844-878) and Hywel the Good (c. 904-949), author of a famous law code, consolidated their rule, but disruption, as usual, followed their deaths. Gruffydd ap Llywelyn (1039-63) again united Wales and conquered some English districts, but Harold retaliated.

The Norman conquest of England was quickly followed by attacks on Wales. The march, organized by William I, was the scene of constant warfare. The earl of Gloucester, Robert FitzHamon, conquered all the S., which was held down by a chain of strong castles. Henry I planted Flemings in Pembrokeshire, and most of N. Wales was overrun. These disasters awoke the dormant spirit of Cymric nationalism. The Normans were heavily defeated at Cardigan, 1136, and Owain Gruffydd (1137-69) strove for national union and defied Henry II. With the greatest Welsh monarch, Llewelyn (*q.v.*) or Llywelyn the Great (1196-1240), the house of Gwynedd became supreme, and Wales seemed at last

to have become a stable political state under English suzerainty. The S. accepted Llywelyn's rule, and a national council met at Aberdovey in 1215.

The end, however, was near. Llywelyn ap Gruffydd (1264-82), grandson of his great namesake, foolishly intrigued against Edward I. Resolved to assert his supremacy, the English king marched against him, and forced him to submit. Joining a rising which his brother David had instigated, Llywelyn was slain, 1282, and the next year David was captured and beheaded. Wales was annexed, 1284, and Edward's infant son, born at Carnarvon, was made prince of Wales. Welsh law was allowed to remain in the country parts, but boroughs were formed, settled with English, and placed under the law of England. Trade was encouraged, and prosperity increased. The revolt of Owen Glendower (*q.v.*) was a brief episode.

Religious Secession

The Welsh supported Henry VII, who was of Welsh descent, and the Tudors favoured the principality. The Act of Union in 1536 made English law general, and admitted representatives of Wales to parliament. In 1542 the Council of Wales was formed. The Reformation was quietly accepted, Puritanism was slow in developing, and the country was Royalist in the Civil War. The people, however, were gradually alienated from an Anglicised, apathetic, and often corrupt Church. Religious and educational reform was inaugurated by a Carmarthenshire rector, Griffith Jones (1683-1761), and carried on with remarkable results by Howell Harris of Trevecca, Daniel Rowland and Thomas Charles of Bala. There was a great secession from the established Church in 1811, that of the Calvinistic Methodists, while the Congregationalists and Baptists became powerful bodies. Thus a cleavage arose between the conservative, Anglican gentry and the radical, Nonconformist masses. Nonconformity displayed great zeal for disestablishment, which came in 1920.

Between the two Great Wars the unemployment and distress in the S. Wales coal districts became notorious. They formed one of the worst of the depressed areas.

Welsh nationalism was kept alive by the revival of the *Eisteddfod* (*q.v.*) from 1798 onwards; by the development of Welsh literature and the press; by the influence of the university of Wales,

by the cultivation of national music, and the use of the Welsh language in schools; and by the establishment of a separate region of the B.B.C. for Welsh broadcasting. Yet this nationalisation has tended usually to be cultural rather than political. Movements to introduce home rule or its equivalent have been put forward from time to time but with only slight support. The Welsh Nationalist vote in the 1950 general election was only 19,091, and seven of the eight candidates were at the bottom of the poll. A proposal for a separate ministry for Wales was rejected in 1948.

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Wales, CHURCH OF. Popular term with two meanings. (1) The Anglican Church in Wales, which was disestablished in 1920 and has six episcopal sees—Bangor, Llandaff, Monmouth, St. Asaph, St. David's, Swansea and Brecon—the bishop's meeting to choose one of their own number as archbishop of Wales. (See Church of England; Diocese, map; Disestablishment.) (2) The Calvinistic Methodist Church of Wales, described under that heading.

Wales, PRINCE OF. Title borne by the eldest son of a British sovereign. See Prince of Wales.

Wales, UNIVERSITY OF. Welsh national university. It dates from 1893, and consists of colleges at Aberystwyth, Bangor, Cardiff, and Swansea, with the national school of medicine at Cardiff. The college at Aberystwyth dates from 1872, that of S. Wales and Monmouthshire at Cardiff from 1883, and that of N. Wales at Bangor from 1886. University College, Swansea, formerly Swansea technical college, was admitted to the university in 1920. The school of medicine was incorporated by royal charter in 1931. The university leaves teaching to the colleges, but prescribes courses of study and conducts examinations for degrees. The colleges are provided with museums, laboratories, and libraries, as well as hostels for residence. Degrees can

be taken in almost all subjects, and university extension courses are provided. There are over 4,000 students and a teaching staff of some 424. Theological colleges at Aberystwyth, Bala, Bangor, Brecon, Cardiff, and Carmarthen are affiliated to the university, which up to 1930 was represented by one M.P. See Gowns colour plate.

Walewski, ALEXANDRE FLORIAN JOSEPH COLONNA, COUNT (1810-68). French diplomatist. Born at Walewica, Poland, May 4, 1810, son of Napoleon I by Marie Walewska, he was educated at Geneva and Warsaw. Espousing the Polish nationalist cause, he took part in the insurrection against Russia, 1831, and, returning to France, was naturalised and entered the French army, 1832-37. He was ambassador successively in Florence, Naples, Madrid, and London, 1849-54, and as foreign minister 1855-60, was at the Paris conference of 1856. During 1860-63 he was minister of fine arts. Walewski, who had been ten years a senator and then president of the *corps législatif*, 1865-67, died at Strasbourg, Sept. 27, 1868. *Pron.* Val-yef-ski.

Waley, ARTHUR DAVID. Contemporary British scholar. Taking as his field the art of China and Japan, he achieved the reputation of an unexcelled translator. His own poetic gifts helped him to render Oriental verse into English; he dealt also with the Japanese Nô plays, the Analects of Confucius, and the Tale of Genji. He wrote an Introduction to the Study of Chinese Painting, and Three Ways of Thought in Ancient China. A product of Rugby and King's College, Cambridge, Waley was sometime assistant keeper of prints at the British Museum.

Walvisch Bay. Bay of S.W. Africa, also called Walvis Bay (*q.v.*).
Walham Green. District of London. Long since built over, it is in the met. bor. of Fulham, with a station on the District rly. line to Wimbledon between West Brompton and Parsons Green. It was known formerly as Wendon Green, from the old manor of that name. It is now a busy centre for various bus routes, and the station is the nearest to Stamford Bridge, the ground of Chelsea A.F.C.



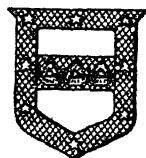
Count Walewski,
French diplomatist

Walker, DAME ETHEL (b. 1867). British painter. Born at Edinburgh, she studied art at the Slade School under Frederick Brown, and was elected a member of the New English art club in 1900. She exhibited for many years at the R.A., being elected A.R.A. in 1940. Works by her were purchased by the Tate Gallery, the Contemporary Art society, and many provincial galleries. She held exhibitions at London galleries and her paintings were shown all over the world, including the British Council exhibition at the World's Fair (New York) in 1939. Her subjects were portraits, seascapes, flowers, nudes, and large mural decorations.

Walker, SIR EMERY (1851-1933). British printer. Born in London, April 2, 1851, he helped to found the Arts and Crafts exhibition society, 1888, and was associated with William Morris in setting up the Kelmescott press in Hammersmith, 1890. Well known as a printer, process engraver, and photographer, and an authority on fine art printing, he established the business of Emery Walker, Ltd., and was a founder of the Doves Press, 1900-09. He became master of the art workers' guild, 1904, and trustee of the Wallace Collection, 1924. In the latter year he was also chosen Sanders reader in bibliography at Cambridge. Walker's collection of printed books included a complete set of the Kelmescott press publications. He was knighted in 1930, and died July 22, 1933.

Walker, ERNEST (1870-1949). British musician. Born at Bombay, July 15, 1870, and educated privately, he was director, 1900-25, of music at Balliol College, Oxford, of which he became an honorary fellow in 1926, and lecturer in harmony at Oxford, 1918-22. Well known as a pianist, he also composed a large number of works, including string quartets and quintets, sonatas for violin and piano, works for chorus and orchestra, and many pianoforte pieces; his songs, probably his best known works, include vocal quartets from England's Helicon. Walker also made a name as a writer on music, his books including Beethoven, 1905, and A History of Music in England, 1907, revised edition, 1923. He died Feb. 21, 1949.

Walker, FREDERICK (1840-75). British artist. Born in London, May 24, 1840, he studied at Leigh's academy and the R.A. schools, afterwards becoming ap-



University of Wales
arms

prentice to J. M. Whymper, the wood engraver. Illustrative work occupied him till 1866, when he was elected a member of the Water Colour Society; he became A.R.A. in 1871. His pastorals, e.g. *The Harbour of Refuge*, and *The Vagrants*, were based on a profound study of Greek design.



Frederick Walker,
British artist
Self-portrait

He died at St. Fillans, Perthshire, June 5, 1875.

Walker, GEORGE (1618-90). Irish clergyman and defender of Londonderry. Born in Tyrone and educated at Glasgow university, he was ordained, and in 1688 was holding the livings of Lissan and Donaghmore, near Londonderry (q.v.). Responding to the call of the troublous times, he raised troops to defend Londonderry, and despite his advanced age held the place against James II for 105 days until its relief, July 30, being granted £5,000 by the king as a reward. On William's arrival in Ireland Walker joined his colours, and fell in the battle of the Boyne, July 1 (o.s.), 1690.



George Walker,
Irish clergyman
After Kneller

Walker, JAMES J. (1881-1946). American politician. Born in the Greenwich Village district of New York, June 19, 1881, he became a barrister in 1912, and, entering municipal politics as a Democrat, was elected mayor of New York as a representative of the Tammany Hall organization in 1925. He was re-elected in 1929, but soon came into conflict with F. D. Roosevelt, then governor of New York, the more sober members of the Democratic party objecting to the gaiety with which he filled his office. In 1931 a petition to Roosevelt was organized, but "Jimmy" Walker won an appeal to the Supreme Court against its presentation; a year later he resigned. He died Nov. 18, 1946.

Walker, THOMAS DAWSON (1850-1934). An English clown. Known as Whimsical Walker, he was born at Hull, son of a circus manager, and became a clown at the age of 10. He worked at Astley's, Sanger's, Barnum's, and Hengler's circuses, and was for

many years the chief figure in the harlequinade at the Drury Lane pantomime. Famous as a trainer of animals, he gave a performance with his singing donkey before Queen Victoria at Windsor in 1886, and from 1928 appeared annually at the Olympia circus. The last clown of the Grimaldi tradition, he died at Gorleston, Norfolk, Nov. 12, 1934. His reminiscences, *From Sawdust to Windsor Castle*, appeared in 1922.



T. D. (Whimsical)
Walker,
English clown

Walker, WILLIAM (1824-60). American adventurer. Born at Nashville, Tennessee, May 8, 1824, he tried law and journalism, and then embarked on the series of expeditions which made him famous. The scenes of these included the Mexican province (now state) of Sonora (1853), which led to his being charged with a violation of neutrality; Nicaragua (1855), where he made himself president and c.-in.-c., but was driven out by a coalition of the Central American states; and Honduras. Soon after landing there he was forced to surrender to the captain of a British man-of-war, who gave him up to the government. He was tried, condemned, and shot at Trujillo, Sept. 12, 1860.

Walker Cup. Trophy, presented by G. H. Walker, president of the U.S. golf association, and competed for by amateur golfers representing Great Britain and the U.S.A. The first competition was in 1922. It takes place, usually at two-year intervals, alternately in the two countries, and the result is determined by singles and foursomes. In the 1938 competition the cup was won by Great Britain.

Walker, London. A comedy by J. M. Barrie. It was produced Feb. 25, 1902, at Toole's Theatre, London, where it had a run of 511 performances. The cast included J. L. Toole, Irene Vanbrugh, G. Shelton, Seymour Hicks, and Mary Ansell.

Walking. Slow movement, i.e. not running, on foot. Walking for pleasure, especially in the countryside, was a recreation which became very popular in most countries during the 1920s and 1930s, when it was often called hiking. Walking races, on the other hand, are a very strenuous

sport, the official definition of walking issued by the A.A.A. being "progression by steps so taken that unbroken contact with the ground is maintained." If this rule is broken the competitor is disqualified and must at once retire from the race. Among records are the following: 1 m., 6 min. 21.2 sec. (P. Bernhardt, Latvia); 20 m., 2 hours 41 mins. 7 sec. (H. Olsson, Sweden); 1 hour's walking, 8 m. 1025 yards (J. F. Mikaelsson, Sweden). In the 1948 Olympic Games the 10,000 metre walk was won by J. F. Mikaelsson in 45 mins. 31.2 sec., thus setting up a new Olympic record, and J. A. Ljunggren (Sweden) won the 50,000 metre walk in 4 hrs. 41 min. 52 secs.

Walkley, ARTHUR BINGHAM (1855-1926). A British dramatic critic. Born at Bristol, Dec. 17, 1855, he was educated at Corpus Christi College, Oxford. In 1877 he entered the post office and, having been assistant secretary since 1911, retired in 1919. During much of this time Walkley was the dramatic critic of *The Times* and he made himself, by his witty and learned writings, one of the foremost critics of his day. His books include *Drama and Life*, 1907. He died, Oct. 7, 1926.

Walküre, DIE. German title of the opera by Wagner known in English as *The Valkyrie* (q.v.).

Wall. Structure of solid material, e.g. brick, stone, and concrete, or of sheeting, such as plaster-board, on framing, forming an enclosure. (See *Plaster*.) Solid walls without framing support upper floors and roofs and are called load-bearing walls. Framed walls carry superimposed loads on beams and columns, the walling material being in the form of non-load-bearing panels or of sheeting. A cavity wall has comparatively thin sections separated by a 2-in. cavity and held apart by rustless metal ties, the purpose of the cavity being to prevent the passage of damp. External walls of houses of normal brick construction are 9 ins. thick if solid and 11 ins. thick if with a cavity. Partition walls are usually 4½ ins. thick.

Walls of large modern buildings are mostly framed and panelled, as this avoids the very thick solid walls which are necessary if heavy loads are to be carried by the walling material. See *Aurelian's Wall*; *Bricks and Brick-making*; *Britain*; *Building*; *Great Wall*; *Hadrian's Wall*; *House*; *London Wall*; *Party-Wall*; *Roman Wall*; *Wailing Wall*.

Wall, Sir Frederick Joseph (1858-1944). Secretary of the Football Association. Born April 14, 1858, he was educated at St. Mark's College, Chelsea. A keen footballer as a young man, he became interested in the organization of the game, and having served on various regional committees and acted as secretary for the amateur cup competition, he was in 1895 appointed secretary of the football association. He held that position till 1934, raising the membership of the association from 1,000 to 750,000. Upon retiring he published *Fifty Years of Football*. He was one of the founders of the British Olympic association. He died March 25, 1944.



Sir F. J. Wall,
Secretary of the
Football Association

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Wallaby. Name given to several of the smaller species of kangaroos. They are smaller in size and brighter in colour than the typical kangaroos, and there is a slight difference in the incisor teeth and the palate. They occur in the dense scrub of Australia, Tasmania, and New Guinea. See Kangaroo.

Wallace, Alfred Russel (1823-1913). A British scientist. Born at Usk, Mon, Jan. 8, 1823, he became acquainted in youth with H. W. Bates, through whose influence he became interested in natural history. Wallace spent 1848-52 collecting in the Amazon region, and 1854-62 in



A. Russel Wallace,
British scientist

the Malay Archipelago, publishing valuable accounts of the expeditions and drawing the dividing line between Lombok and Bali, which separates Asia from Australasia. This is still known as Wallace's line. While in Borneo he wrote his famous essay on the law which has regulated the introduction of new species, in which he independently formulated Darwin's theory. A man of broad and often controversial views. Wallace was honoured by many scientific institutions and universities and was given the O.M. in 1910. He died Nov. 7, 1913. His many books include *Travels on the Amazon*, 1853; *The Malay Archipelago*, 1869; *Natural*

Selection, 1870; *Miracles and Modern Spiritualism*, 1874; *Darwinism*, 1889; *Studies, Scientific and Social*, 1900; *Man's Place in the Universe*, 1903; *My Life*, 1905; *Social Environment and Moral Progress*, 1912. See Darwinism.

Wallace, Edgar (1875-1932). British novelist and playwright. Born in London of unknown parents, he was found as a week-old baby by a Billingsgate fishporter who adopted him. With only a primitive education, Wallace became a newspaper seller at Ludgate Circus, and later took menial posts. At 21 he joined the army and was drafted to S. Africa. In his spare time he did some freelance journalism, and on the out-



Edgar Wallace,
British novelist

out more than 150 novels, as well as 14 plays, several film scenarios, and much incidental journalism, including at one time a daily article on racing, in which he was always interested. He died suddenly in Hollywood, Feb. 10, 1932.

The detective and mystery stories which were Wallace's most typical works were, at their best, ingenious and well constructed and, at their worst, readable, though they often showed signs of over-hasty writing. Among the most successful were *The Man Who Knew*, *The Mind of Mr. J. G. Reeder*, *The Green Archer*, *The Melody of Death*, and *The Angel of Terror*. Better polished, though less characteristic, were the early stories of Africa, introducing such well delineated characters as Sanders, the commissioner, and Bosambo, the native chief. In his later years Wallace turned to the theatre and scored noteworthy successes with *The Ringer*, *The Terror*, *The Squeaker*, and *On the Spot*. These, like the best of his novels, showed a great power of creating exciting situations and maintaining suspense, as well as a salty humour. In 1930 he unsuccessfully contested Blackpool as a Liberal. In 1934 a memorial tablet to "Edgar Wallace, Reporter," was erected at Ludgate Circus, above the spot where he had once sold newspapers. His autobiography, *People*, appeared in 1927, and his *Hollywood Diary* in 1932. A biography by his daughter-in-law, Margaret Lane, was published in 1938.

John Rowland

Wallace, Henry Agard (b. 1888). American politician. Born Oct. 7, 1888, and educated at Iowa state college, he became associate editor, 1910-24, and editor, 1924-29, of Wallace's *Farmer*, which, founded by his grandfather, enjoyed great prestige in mid-western states. As a farmer he worked out the first corn



Wallaby. A mother and her young
of this smaller species of the
kangaroo family

break of the S. African War was appointed war correspondent by Reuter's. S. African representative of the *Daily News*, 1900, and the *Daily Mail*, 1901-02, he became the first editor of the *Rand Daily Mail*, but soon returned to Fleet Street to become a reporter.

Meanwhile, he had tried his hand at fiction, and first attracted notice in 1906 with *The Four Just Men*, a sensational mystery story of a new type, for which Wallace soon became world-famous. Having now discovered where his talents lay, he turned

(maize) hog ratio charts, and in 1933 became secretary of agriculture in the Roosevelt cabinet, a post he retained until elected in 1940 vice-president. In 1944



H. A. Wallace,
American politician

H. S. Truman was preferred by Roosevelt as vice-president, and Wallace became secretary of commerce next year, when he published *Sixty Million Jobs*.

Resigning in 1946 after his attack on the administration's attitude to Russia, he soon launched a crusade to reverse what he believed the mistaken direction of U.S. foreign policy, touring Europe and holding meetings. As candidate of his newly founded Progressive party for the presidency in 1948 Wallace polled 1,157,172 votes only (out of 48,836,579).

Wallace, LEWIS (1827-1905). American soldier and novelist. Born at Brookville, Ind., April 10,



Lew Wallace,
American novelist

1827, he served in the Mexican War, became major-general in the Civil War, and was governor of New Mexico, 1878-81, afterwards going to Turkey as minister for four years. He died Feb. 17, 1905. Lew Wallace is remembered for Ben Hur, 1880, a story of Palestine and Rome in the time of Christ. This was a success when adapted for the stage, and an even greater one on the screen.

Wallace, NELLIE (d. 1948). British variety artist. Eleanor Jane Wallace was born of English parents at Glasgow, on March 18, 1882, according to books, though allegedly at least ten years earlier. She first appeared as a juvenile clog-dancer at the Steam-Clock music hall, Birmingham, in 1888, came to London in 1903, and in 1910 was in the programme of the Palladium at its opening. Billed as The Essence of Eccentricity she created a new style of burlesque; her ludicrous tripping gait was set off by a thin feather boa, minute hat with feather, tight skirt, and elastic-sided boots. Her songs usually dealt comically, and sometimes cruelly, with the girl who was jilted in her love affairs. She was renowned as a dame in London pantomime, and toured in revue as late as 1945, in That'll Be the Day. After figuring in the royal command variety programme of 1948, she was taken ill, and died Nov. 24.

Wallace, SIR RICHARD (1818-90). British art collector. Born in London, July 26, 1818, perhaps a natural son of Maria, marchioness of Hertford, he was brought up in Paris. In 1870 he inherited Hertford House (q.v.), together with its pictures and other works of art. During the siege of Paris he spent large sums on the organization of ambulances and

the endowment of a British hospital, for which services he was rewarded with a baronetcy, 1871. He was M.P. for Lisburn, 1873-85, and died in Paris, July 20, 1890. His widow at her death in 1897 left to the nation the Wallace Collection (q.v.).

Wallace, SIR WILLIAM (c. 1270-1305). Scottish hero. Supposed to have been a son of Sir Malcolm Wallace, a knight of Renfrewshire, according to the history of Blind Harry, he spent his early years in Stirlingshire and Dundee. The tale goes that he killed an Englishman in revenge for a slight, and was outlawed. He fled into the hills, gathered a force of malcontents and desperadoes, later joined by nobles and ecclesiastical dignitaries who wished to use Wallace against their common enemy the English, and carried on guerrilla war. Such wild deeds as the attack on the English court of justice at Scone, and the burning of the soldiers' quarters in the barns of Ayr, attracted to Wallace more followers, but also the notice of Edward I of England, who dispatched a large army against him. At Irvine, in July, 1297, a treaty was drawn up by which Wallace lost the support of his wealthier supporters, and he fled.

Within two months Wallace had a considerable army, recaptured most of the forts N. of the Forth, and invested Dundee, when he heard news of a large English force moving to attack him. Marching quickly to Stirling,



Sir Richard Wallace,
British art collector

he stationed himself at Abbey Craig above the Forth; as the English crossed the river on Sept. 11 he fell upon and almost annihilated them, pursuing the remainder to Berwick. Wallace then advanced into England and laid it waste as far as Newcastle. He was chosen guardian of the Scottish kingdom, but was hindered by the jealousy of the nobles, though he effected important reforms in military organization. Edward hastened home from Flanders and arrived in Scotland at the head of a large force, which on July 22, 1298, came up with Wallace at Falkirk. The battle ended in the rout of the Scottish army and the flight of its general. For years he lived in obscurity, an outlaw and a rebel. Eventually he was hunted down and captured, possibly through treachery, Aug. 5, 1305, near Glasgow. He was taken in chains to London, tried as a traitor at Westminster Hall, and on Aug. 23 executed, his body being barbarically maltreated.

Wallace possessed all the qualities of a national hero; a man of great strength and height, he had infinite courage and a personality which drew men. His career was, of course, romanticised by later generations, but his influence on them never failed. He had the makings of a wise statesman, and restored order and unity for the only time for centuries. Wallace's life was written by A. F. Morison, 1898, and his name has been immortalised in Burns's poem, Scots wha hae.

Wallace, WILLIAM VINCENT (1813-65). A British composer. Born at Waterford, July 1, 1813, the son of a regimental bandmaster, he became well-known as a violinist in Dublin, and in 1834 began a roving career in Australia, India, and S. America, which lasted ten years and included escapes from violent death. In 1845 he settled in London, to produce immediately his popular opera, Maritana, which enjoyed great success. Lurline, 1860, another opera, was equally admired at the time. Wallace's piano pieces and operas, many composed on the Continent, are little known. He died Oct. 12, 1865.

Wallaceburg. Town of Ontario, Canada. It is in Kent co. in the S.W. corner of the province, on the Sydenham river, which is navigable for the largest lake vessels. It has bus connexion with the C.P.R. and C.N.R., at Chatham, and is on Père Marquette rly. Chief industries



Sir William Wallace. The statue of the Scottish hero erected in Aberdeen

are carried on at glass works, flour and flax mills, machine shops, shipyards, and a sugar refinery. Pop. 4,986.

Wallace Collection. Gallery of works of art in London. The collection made by the 3rd and 4th marquesses of Hertford and Sir Richard Wallace, was bequeathed by Lady Wallace (d. 1897), widow of Sir Richard, to the English nation. Hertford House, Manchester Square, was bought, and the gallery was opened to the public in 1900. French masters of the 18th century are represented, while the Italian and Spanish works include fine examples of Titian, Velazquez, and Murillo; Rembrandt, Rubens, and the English portraitists are represented. Besides sculpture and other *objets d'art*, there is an armoury, and the assembly of 18th century French furniture and porcelain is unique. See Hertford House.

Wallace's Line. Division, coinciding with Lombok Strait, between the W. islands of the Malay archipelago (having Asiatic fauna) and the E. islands (with Australasian). It was first noted by Alfred Russell Wallace (*q.v.*) on his travels in the region 1854-62.

Wallach, Otto (1847-1931). German chemist, born March 27, 1847, at Königsberg, now Kaliningrad. Professor of chemistry at Göttingen, 1876-1915, he specialised in the chemical and analytical treatment of terpenes and camphor, and helped to give volatile oils and scents industrial importance. He was awarded the Nobel prize for chemistry in 1910. His chief book was *Terpene und Kampfer*, 1909. He died Feb. 26, 1931.

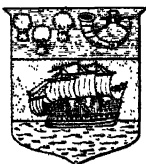
Wallachia or **WALACHIA** (Rum. Muntenia). Prov. of Rumania. It lies in the S. of the country and includes the capital Bukarest. Covering an area of 29,960 sq. m., it is a plain of great fertility and the principal agricultural area of Rumania. It takes its name from the Wallachs, a nomadic people of the Balkans of Roman or partly Roman descent and speaking a language of Latin origin. An independent principality from the Middle Ages, Wallachia was, however, at least after 1343, compelled to pay tribute to the Turks, and later was ruled by Turkish appointees. In 1861 Wallachia was united with Moldavia to form Rumania.

Wallaroo. Seaport of South Australia. It stands on the E. side of Spencer Gulf and is 120 m. N.E. of Adelaide by rly. It is the port

for a very extensive agricultural area. Copper, lead, barley and wheat are exported, machinery and phosphate rock being the chief imports. Wallaroo, Kadina, and Moonta form a group of closely connected townships. Pop. 10,000. The mining areas close by have a pop. of 5,000.

Wallas, GRAHAM (1858-1932). English sociologist. He was born at Sunderland May 31, 1858, and educated at Shrewsbury, and Corpus Christi College, Oxford. Lecturer at the London School of Economics from 1895, he was one of the founders of the Fabian Society and played a prominent part in civic affairs as a member of the L.C.C. and of the London school board. Appointed in 1914 professor of political science at London university, where he stayed nine years, he wrote books advocating a view of international cooperation that influenced many contemporaries and students. His best-known works were *Life of Francis Place*, 1897; *Human Nature in Politics*, 1908; *The Great Society*, 1914; *Our Social Heritage*, 1921; *The Art of Thought*, 1926. Wallas died Aug. 9, 1932.

Wallasey. Co. and mun. bor. and seaside resort of Cheshire, England. It is situated on the



Wallasey arms

Wirral peninsula at the mouth of the Mersey and is separated from Birkenhead by a channel called the Great Float. It is a railway terminus. The old parish church of S. Hilary was rebuilt, after fire, in 1859. The bor. of Wallasey comprises New Brighton, Egremont, Seacombe, Liscard, and Poulton, residential suburbs of Liverpool and connected with that city by ferry and the Mersey Tunnel. The corporation maintains parks, recreation grounds, boating lake, golf links, schools, and libraries. The borough has a sea and river front 7 m. long, and one of its open-air swimming-baths is the biggest in the world. The holiday resort area centres on New Brighton. Wallasey sends one member to parliament. Pop. est. 100,300. See Wirral.

Walla Walla. City of Washington, U.S.A. The co. seat of a co. with the same name, it stands on the Oregon border, 208 m. E.N.E. of Portland. There is a station on the N. Pacific rly. Prosperity set in soon after the opening of the

Idaho gold mines, but the place was long disorderly and looked after by Vigilantes. It has flour-milling and meat-packing establishments. Pop. 18,109.

Wallenstein, ALBRECHT WENZEL EUSEBIUS VON (1583-1634). German soldier. Born to a noble Lutheran family at Hermanic, Bohemia, Sept. 15, 1583, he was educated at Olmütz, and became a professor but never devout R.C. He next went to the university



A. von Wallenstein, Bohemian soldier

of Altdorf, thence to Bologna and Padua, became a believer in astrology, and went on a tour of western Europe. Having fought for the emperor, Rudolph II, in Hungary, he married a widow, who brought him great wealth and, after her death in 1614, large estates in Moravia. He raised, equipped, and commanded a company of horse in the service of the Emperor Ferdinand against Venice in 1617, and then married another heiress. In high favour at the imperial court, he refused to listen to the revolutionaries on the outbreak of the Bohemian revolt, 1618. Instead he got together a regiment of cuirassiers, saving Vienna from disaster by taking command of the imperial forces after the death of Buquoy. He was made a prince of the empire in 1623, and duke of Friedland in 1625.

Wallenstein defeated Mansfeld at Dessau, 1626, and having outmanoeuvred both him and Bethlen Gabor, forced upon them a truce. Next he pursued Christian of Denmark through to the sea. Within two years the Catholic cause had been made supreme: Wallenstein was given the duchy of Mecklenburg. He desired a Germany united under the emperor and enjoying religious toleration, but in 1629 came the Edict of Restitution, a fatal blow at Wallenstein's policy.

For two years the successes of Gustavus forced the emperor again to ask his aid in 1632, and he raised another army, which cleared Bohemia of the Saxons, and forced the Swedes to withdraw from Nuremberg. The emperor promised to cancel the Edict of Restitution; he failed to implement the promise, and Wallenstein planned to desert him. He made overtures to the Protestant powers,

upon which the emperor charged him with treachery, and Wallenstein was murdered by a party of his own soldiers at Eger (Cheb), Feb. 25, 1634.

Wallenstein developed from a brilliant soldier of fortune into a man of wide intellect, ambitions, and schemes. Instead of allowing his armies to live on the country, he provided his own train of supplies, derived, with the pay of his mercenaries, from prescriptions on imperial authority. To accuse him of treachery to the emperor is not altogether fair. He was cold, calculating, and judiciously cruel. Utterly unprincipled, he stands out from his contemporaries as soldier and administrator, and his death removed the one man capable of giving either side in Germany a decisive victory. Schiller wrote a great tragedy on his career. *Pron.* Vahlenshtine.

Waller, EDMUND (1606-87). English poet and politician. Related to both Cromwell and Hampden, he was born March 9, 1606, at Coleshill, now in Bucks. After education at Eton and King's College, Cambridge, he sat in parliament from 1624. Inheriting the

Ed Waller

Beaconsfield estate on his father's death in 1616, Waller in 1631 married a London heiress, Anna Bankes (d. 1634), paid unsuccessful court to Lady Dorothy Sidney, the Scharissa of his verse, and later wedded Mary Bracey (d. 1677), of Thame. Involved in a plot to secure London for Charles I in 1643, he was fined £10,000 and banished, but was pardoned by Cromwell in 1651. Father of the house at his retirement in 1677, he died at Hall Barn, Beaconsfield, Oct. 21, 1687.

Waller was renowned for lyric verses in his own day, and the exquisite *Go, Lovely Rose*, survives in very many anthologies, while some lines written in extreme old age should be remembered for their depth and sincerity. But his importance for poetry is as a reformer who pruned away the luxuriant conceits of the metaphysical school and developed afresh the heroic couplet. *Consult* Works, ed. G. Thorn-Drury, 1893.

Waller, LEWIS (1860-1915). British actor. William Waller Lewis, who was born at Bilbao,



Lewis Waller,
British actor

Hotspur, Henry V, and Brutus, and became the popular romantic hero of the day in such costume plays as *The Three Musketeers*, *Robin Hood*, and *Monsieur Beaucaire*. He was manager successively of the Haymarket, Shaftesbury, Imperial, and Lyric theatres. He died Nov. 1, 1915.

Waller, SIR WILLIAM (c. 1597-1668). English soldier. Son of the lieutenant of Dover, he was sent to Magdalen Hall, Oxford. He fought in the Thirty Years War, being knighted 1622. On the outbreak of the Civil War he served as a parliamentarian colonel of horse in the West, but after gaining successes was defeated at Lansdown and Roundway Down, 1643. Having captured Basing House and Arundel, he again lost a battle, at Cropredy Bridge, 1644. A strong Presbyterian, Waller proposed the formation of the new model army, and retired from the field under the Self-Denying Ordinance. At the close of the protectorate he took part in negotiations for the restoration of Charles II. He died Sept. 19, 1668.

Wallflower (*Cheiranthus cheiri*). Perennial herb of the family Cruciferae, native of N. and Central

Spain, Nov. 3, 1860, first appeared at Toole's Theatre in 1883. He played leading Shakespearean parts under Tree's and his own management, especially

Hotspur, Henry V, and Brutus, and became the popular romantic hero of the day in such costume plays as *The Three Musketeers*, *Robin Hood*, and *Monsieur Beaucaire*. He was manager successively of the Haymarket, Shaftesbury, Imperial, and Lyric theatres. He died Nov. 1, 1915.



Sir William Waller,
English soldier

Europe. It forms a small bush a foot or two in height, with alternate lance-shaped leaves and racemes of fragrant flowers, which in the natural state are orange-yellow, but under cultivation vary from a clear yellow through blood-red to dark brown. The plant was introduced to British gardens in the latter half of the 16th cent. In many places it has become naturalised on ancient walls, and these escapes have reverted to the natural yellow of the flowers.

Wall Game. Football match peculiar to Eton College. The most completely original variant, unlike any game of football seen elsewhere, it has been played since time immemorial every S. Andrew's day (Nov. 30) between Collegers and Oppidians. The teams, eleven a side, line up at the middle point of a wall 120 ft. long. Some distance on each side of this point is a calx (chalk mark). Play is restricted to a distance of 6 yds. from the wall. Five of the players on each side, the bullies, keep close to the wall and form the nucleus round which a scrummage is concentrated. Players endeavour to push the ball behind their opponents' calx, and there touch it on the wall with the hand. If anyone succeeds, his side is allowed to shy at goal—at one end a garden door, at the other a marked space on a large elm. As it is almost impossible to get the ball beyond the



Wallflower. Leaves
and flowers

goal's defenders, the game is decided by shies; one goal counting as 10 shies.

Wallingford. Mun. bor. and market town of Berks, England. On the Thames, here crossed by a long, stone bridge, the town is 15 m. N.W. of Reading, and the terminus of a branch rly. There are three parish churches, of which the oldest is that of S. Leonard



Wall Game. The football game peculiar to Eton College, played annually on S. Andrew's day

(11th century). In the church of S. Peter Sir W. Blackstone is buried. The castle, containing Roman and Danish remains, was the scene of a 16 weeks' siege by parliamentary forces during the Civil War, 1646, and was mostly demolished a few years later. The town occupies the site of a Roman camp. The treaty of Wallingford is the name of the peace made here in 1153 between Stephen and Matilda. Market day, Fri. Pop. est. 3,700.

Wallis, John (1616-1703). English mathematician. Born at Ashford, Kent, Nov. 23, 1616, and



John Wallis,
English
mathematician

professor of geometry at Oxford. His *Arithmetica Infinitorum*, 1655, contained the principles of the calculus, and became a standard work; it explains the method of arriving at the quadrature of a circle. Wallis introduced the principles of analogy and continuity into mathematics, explained negative and fractional indices, and his *Algebra*, 1685, contained the first systematic use of formulae. Also a logician and grammarian, he died Oct. 28, 1703.

Wallis Archipelago. French colony in the Pacific Ocean. The group lies N. of Tonga and N.E. of Fiji and consists of Wallis (Uvea) and Futuna islands: area, 40 sq. m.; pop., 4,243. It was placed under French protection in 1842.

Walloon (akin to Welsh, foreigner). Dominant ethnic stock in S.E. Belgium, with offshoots in the French frontier depts. Numbering under 3,000,000, they are of Alpine stock, descended from the ancient Gallic Belgae, with Teuton and Roman admixture. Their archaic Romance dialect is in colloquial use by a fraction of the Walloons, who commonly speak French.

In Elizabeth's reign, and in Stuart times, Walloon Protestant refugees settled at Canterbury and elsewhere in England, practising silk weaving and cloth manufacture; and in Canterbury cathedral crypt they maintained separate worship from 1561. See Belgium.

Wallpaper. The practice of covering walls with decorative paper is mentioned under Painting and Decorating.

Wall Pennywort, NAVELOWORT, OR PENNY PIES (*Cotyledon umbilicus*). Perennial herb of the

family Crassulaceae, a native of Europe, W. Asia, and Africa. It has a fleshy root-stock, from which spring the round fleshy leaves, one in. to three ins. across, depressed in the centre and with the leaf-stalk attached to the middle of the underside. On the flowering stem they are spoon-shaped and wedge-shaped. The stem, which varies from 6 to 18 ins., is covered with drooping, greenish-white cylindrical flowers. It commonly grows on rocks or in crannies of old walls.

Walls, Tom Kirby (1883-1949). British actor. Born at Kings-
thorpe, Northants, Feb. 18, 1883,



Tom Walls,
British actor

he attended Northampton county school, and became a London policeman. He first appeared on the stage in pantomime in Glasgow, 1905, and made his London debut two years later. He played mainly in musical comedy, and in 1922 entered into management with Leslie Henson, presenting *Tons of Money* at the Shaftesbury Theatre. Walls then put on at the Aldwych Theatre (*q.v.*) a series of successful farces, with himself as a cynical foil for the simplicities of Ralph Lynn and Robertson Hare. In the 1930s he appeared in screen versions of the Aldwych farces. Walls then changed his style, becoming a serious actor of character parts in such films as *Halfway House*, 1944; *Johnny Frenchman*; *The Master of Bankdam*, 1947. Training his own horses, he won the Derby in 1932 with April the Fifth. He died Nov. 27, 1949.

Wallsend. Mun. bor. of Northumberland, England. On the N. bank of the Tyne, 4 m. E. of New-

castle, it stands on the site of the Roman camp of Segedunum, and is named from being the E. end of Hadrian's Wall (*q.v.*). The growth of the town is due to its collieries, opened in the late 18th century, and to shipbuilding and engineering works. It has a rly. station. Wallsend gives its name to a bor. constituency. Pop. 46,980.

Wall Street. Thoroughfare in lower New York City, in which the stock exchange is situated. The name is used as a synonym for the American stock market.

Wall Trees. Horticultural term for trees prepared and grafted for culture against walls; and specifically for fruit trees which have undergone training for this purpose. All pip or stone fruits may be grown against walls, but such protection is an absolute necessity for the ripening of peaches, nectarines, or apricots grown in the open air in Great Britain. They should be grown against walls with a S. or S.W. aspect. See Espalier; Gardening.

Walmer Castle. Official residence of the lord warden of the Cinque Ports (*q.v.*). About 3 m. S. of Deal, the original building, erected in 1539 as a coast block-house, has since been much altered and enlarged. Visitors are admitted.

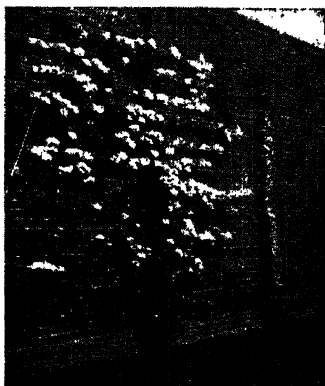
Walney Island. Island off the N.W. coast of Lancs, England, forming part of the county bor. of Barrow-in-Furness, to which it is connected by means of the Jubilee Bridge, opened in 1908. The N. end of the island is joined to the mainland by a causeway accessible at low tide. The island includes the suburbs of Vickerstown N. and S.,



Wallsend arms



Wall Pennywort.
Spike of flowers
and leaves



Wall Trees. A horizontally trained espalier pear tree; right, a single cordon tree



Walmer Castle. Official residence of the lord warden of the Cinque Ports. See facing page

built in the early 20th century by the Vickers co. for the housing of their workpeople. On the W. side, abutting upon the Irish Sea, is a public pleasure ground known as Biggar Bank, a strip of grass nearly two miles long, with a broad foreshore. Bathing, boating, and other recreations are available. Pop. est. 9,100.

Walnut (*Juglans regia*). Large timber tree of the family Juglandaceae. It is a native of Asia, and



Walnut. 1. Cluster of nuts. 2. Leaf. 3. Male catkins. 4. The fruits which contain the nuts

reached Great Britain in the 15th century. It attains a height between 40 ft. and 60 ft., with a broad, spreading head and a short bole, the girth of which may exceed 20 ft., covered with yellow-gray bark which splits in a net-like pattern. The long leaves are broken into 5-9 lance-shaped leaflets, which give off a spicy aroma. The flowers are of two kinds: numerous pollen-bearing (male) blossoms in long, hanging green catkins, and small spikes of one to four female flowers at the tip of a shoot, which develop into the single-seeded fruits (walnuts) enclosed in a wrinkled, stony shell and invested in a green, fleshy coat. These ripen only in the S. parts of Great Britain. The tough, light wood, when mat-

ure, is of a rich brown colour, and though coarse-grained takes a high polish, making it suitable for cabinet-making.

Walpole, HORACE OR HORATIO (1717-97). English author and letter writer. Born in London, Sept. 24, 1717, 4th son of Sir Robert Walpole, 1st earl of Orford, he was educated



Horace Walpole, English author

at Eton and King's College, Cambridge. Made inspector of imports and exports, 1737-38, and usher of the exchequer, controller of the pipe, and clerk of the estreats, 1738, he travelled on the Continent, 1739-41, part of the time with Gray the poet. M.P. for Callington 1741-54; Castle Rising, 1754-57; King's Lynn, 1757-68, he succeeded to the earldom of Orford, Dec., 1791; and, dying in London, March 2, 1797, was buried at Houghton, Norfolk.

In 1747 Walpole had settled near Twickenham, where he built a kind of Gothic castle, collected furniture, pictures, curios, etc. (dispersed at auction, 1842), set up a private printing press, and formed a friendship with Agnes and Mary Berry. He is best remembered by his letters, in which the life of his time is vividly reflected. His *Castle of Otranto*, 1764, inaugurated the tale of terror in English literature.

Bibliography. Works, ed. Mary Berry, 5 vols., 1798; *Memoirs of the Reign of George III.*, ed. G. F. R. Barker, 4 vols., 1894; *Letters*, ed. P. Cunningham, 9 vols., 1857-59, and ed. Mrs. Paget Toynbee, 16 vols., 1903-05; *Horace Walpole and His World*, L. B. Seeley, 1884; *Lives*, L. Melville, 1930; S. Gwynn, 1932; R. W. Ketton-Cremer, 1946.

Walpole, SIR HUGH SEYMOUR (1884-1941). English novelist. The son of George Walpole,



Sir Hugh Walpole, British novelist

bishop of Edinburgh, he was born in New Zealand, March 13, 1884, and educated at King's School, Canterbury; Bede College, Durham; and Emmanuel College, Cam-

bridge. He was for a time a schoolmaster. His first novel, *The Wooden Horse*, 1909, made little stir, but foreshadowed the original symbolism which was to make many of his later stories popular, and with *Maradick at Forty*, 1910, he came to be accepted as a new force in fictional literature. Mr. Perrin and Mr. Traill, 1911, a forceful psychological study of a schoolmaster's life, and probably his best book, was followed by the series dealing with London life. These books were *The Prelude to Adventure*, 1912; *Fortitude*, 1913; and *The Young Enchanted*, 1922. The *Duchess of Wrexhe*, 1914, opened a new series, to which belong *The Green Mirror*, 1918, and *Wintersmoon*, 1928. *The Dark Forest*, 1916, described his war experiences with the Red Cross in Russia; *The Secret City*, 1919, on the 1917 revolution in St. Petersburg, won the James Tait Black prize.

In 1919 Walpole began a new trilogy dealing with the childhood of one Jeremy. Most of the Jeremy books, with *The Cathedral*, 1922, which was dramatised in 1932, dealt with the Cornish town of Polchester. This was also the scene of the *Old Ladies*, 1924, and *Harmer John*, 1926. Walpole also showed himself adept at the writing of "intellectual thrillers" with *Portrait of a Man with Red Hair*, 1925. Meanwhile he had begun his biggest series of novels, *The Herries Chronicle* (*q.v.*). His later novels included *Hans Frost*, 1929, and *Captain Nicholas*, 1934. He acted as adviser to the Hollywood film version of *David Copperfield*, and played a part as a clergyman in it.

As well as being one of the most popular and prolific novelists of his day and country, Walpole was a biographer and critic, writing studies of Joseph Conrad, 1916, and Anthony Trollope, 1928; and author of short stories. He also wrote *The Apple Trees*, *Four Reminiscences*, 1933. First chairman of the Book Society selection committee, he was knighted 1937, and died June 1, 1941. *Consult* H.W.: *A Study*, M. Steen, 1933.

Walpole, SIR ROBERT, 1ST EARL OF ORFORD (1676-1745). English statesman. Born Aug. 26, 1676, at Houghton, into a Norfolk landowning family, he was educated at King's College, Cambridge, inherited his father's estates, and entered parliament in 1701. A typical, coarse-minded, hard-headed, and capable country gentleman, lucid and forcible but not eloquent of speech, with a mastery of figures and a shrewd

judgement of men, marred by a cynical disbelief in their possible disinterestedness, he soon made his mark in the house of commons. He first held office in the Whig administration as secretary of war, 1708; was condemned for corruption in defiance of evidence by a partisan vote in 1712, and



placed in the Tower; but returned to office with the Whigs on the accession of George I in 1714. Thenceforth the Whigs were overwhelmingly predominant in parliament, and there the battles were between Whig factions, not between Whigs and Tories.

The group to which Walpole belonged was practically in opposition from 1717 until 1721, when the collapse of the South Sea Bubble and his own reputation as a financier brought back Walpole and his brother-in-law, Townshend, as the heads of the government, from which Townshend retired in 1730. Walpole, who would endure no rival in the cabinet, dominated the nation for 18 years—the first and longest premiership in U. K. history. He refused a peerage in 1723, but accepted the Garter in 1726. His ascendancy was threatened for a moment at the accession of George II, 1727, only to be re-established more firmly than ever through the influence of George's able queen, Caroline of Anspach. Walpole, without a spark of idealism, directed his policy to the one supreme object of advancing the material prosperity of England, developing her commerce, keeping her at peace, and resisting all temptations to take part in European embroilments. He failed, however, to make any other preparation than the mere accumulation of wealth for the struggle which he himself knew to be almost inevitable. When the conflict with Spain was forced on him by the greed of the nation in 1739, England had a reserve of wealth, convertible into power, which ultimately gave her victory.

Walpole's government was destructive because it was morally debasing, founded on the belief that neither men nor nations are influenced by any but material considerations. Walpole employed the system of parliamentary cor-

ruption more methodically than his predecessors, though a good deal less profusely than his successors; he did not say that "every man has his price," but he acted on that doctrine as a general principle. After being forced to declare war he held on to office, although he was wholly unfitted to be war minister. Resignation was finally compelled in 1742, when he received the title of earl of Orford. He died March 18, 1745. Horace Walpole was his youngest child.

Walpole is supremely important in constitutional history as the first real prime minister, insisting on joint ministerial responsibility and the supremacy of the commons rather than depending for support on royal favour.



Walrus. A young Atlantic walrus. Top, the tusks of an adult male walrus
W. S. Berridge, F.Z.S.

Bibliography. Lives, W. Coxe, 1798-1800; A. C. Ewald, 1878; Lord Morley, new ed. 1921; Bolingbroke and Walpole, J. M. Robertson, 1919; The Endless Adventure, F. S. Oliver, 1930-31; R.W. and His Age, G. R. Stirling Taylor, 1931.

Walpurga (d. c. 779). English missionary and saint. Daughter of Richard, king of the West Saxons, she was sent to Germany by her brother, the bishop of Eichstätt, to help her cousin, S. Boniface, in his missionary work. She became abbess at Heidenheim in 754 and also superintended its monastery from 760. Her festival is on Feb. 25.

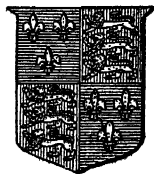
Walpurgis Night. Eve of S. Walpurga's day, which is celebrated in Germany on May 1. It coincided with the old pagan May festival, when witches were believed to assemble on mountains, especially the Blocksberg or Brocken, to riot in the company of demons, and worship the devil, in a witches' sabbath. A scene in Goethe's *Faust* and in Gounod's opera illustrates the legend. See Brocken; Witchcraft.

Walrus (*Odobenus*). Large fin-footed, carnivorous mammal. It is related to the sea-lion, from which it differs in certain details of its dentition, larger size, heavier and bulkier body, and the absence of external ears. When adult, the walrus is at once distinguished by the pair of huge tusks growing from the upper jaw. These often exceed a foot in length, and are used both in fighting and for digging molluscs out of the bed of the sea. A full-grown male walrus is 10 to 12 ft. long, and may weigh 3,000 lb. When young the body is covered with light brown fur, but this tends to disappear later.

There are two rather distinct races of these animals. The Atlantic walrus (*O. rosmarus*) occurs in Spitsbergen and other islands off the extreme N. of Europe, and has been seen as far S. as the coasts of Scotland. In America it occurs on the islands about Baffin Bay. The Pacific walrus (*O. obesus*) is found about Alaska and the N.E. coasts of Siberia. It has been exterminated in many districts by relentless hunting for its oil and hide. Walruses feed almost entirely on bivalve molluscs.

Walrus. Former British amphibious military aircraft. Put into service in 1935, it was adopted by the Royal Navy, as the first amphibian to be catapulted with full military load. A biplane with a wing span of 45 ft., the Walrus had a max. speed of 124 m.p.h. The aircraft, carried a crew of four, and was fitted to drop bombs or depth charges. It ceased to be operational in 1940.

Walsall, Co. and mun. bor. of Staffs, England. Situated 8 m. N.W. of Birmingham and 120 m. from London, it is served by rly. and canal and it possesses an aerodrome. Its geographical position is of great advantage for transport and trade. The parish church of S. Matthew, rebuilt in 1819, contains remains of an older building. Other edifices include the modern council house, town hall, free library, museum,



Walsall arms

institute of science and art, and theatres. There are several recreation grounds, and a memorial to Sister Dora (*see* Pattison, Mark). Queen Mary's school here was founded in 1554. "The town of a hundred trades" makes all kinds of metal and leather goods, especially hardware and saddlery. Walsall had a mayor in the 15th century, and was made a chartered town in 1627, when it was known for buckles and other iron goods. Since 1832 it has sent one member to parliament. Market days, Tues. and Sat. Pop. est. 111,010.

Walsh, JOHN HENRY (1810-88). British writer, A Londoner, born Oct. 21. 1810, he became a member of the Royal College of Surgeons in 1832. Taking to literature, he was for many years editor of *The Field*, and, under the pseudonym of Stonehenge, wrote books on various



J. H. Walsh,
British writer

branches of sport. He was also founder of the National Coursing club and the All-England Lawn Tennis club. Walsh's many works included *Manual of British Rural Sports*, 1856; *The Horse in the Stable and the Field*, 1861; *Dogs of the British Islands*, 1867; and *The Modern Sportsman's Gun and Rifle*, 2 vols., 1882-84. He died at Putney, Feb. 12, 1888.

Walsingham. Town of Norfolk, England. It is situated on the Stiffkey, 5 m. S.E. of Wells, with a rly. station. The parish church of S. Mary, restored in 1861, contains a fine Perpendicular font enriched with carvings. The ruined Augustinian priory of Our Lady of Walsingham was a famous pilgrim resort of the Middle Ages. It was founded in 1061 and grew round the chapel of Our Lady of Walsingham, a copy of the *Sancta Casa* at Nazareth. The ruins include portions of the church, the two wishing wells, parts of the refectory and gatehouses. There are also ruins of a Franciscan friary and some almshouses. Pop. 800. *See* Pilgrim.

Walsingham, Sir FRANCIS (c. 1530-90). English politician and diplomatist. Born at Chislehurst, Kent, and educated at King's College, Cambridge, he was a student at Gray's Inn, 1552, then travelled on the Continent during Mary's reign. He acted as an agent for Burghley, was chief of secret service in London, 1569, ambassador in

France, 1570-73, then secretary of state for 17 years, being knighted in 1577. Walsingham settled in 1579 at Barn Elms, where he entertained Elizabeth. The trial and execution of Mary Queen of Scots was largely due to him. He was chancellor of the duchy of Lancaster in 1587, and was made a K.G.

Walsingham, a sturdy Puritan, developed a fine organization of domestic and foreign spies who betrayed the various R.C. plots against Elizabeth. He never lost her confidence, yet his advice on many important matters, *e.g.* the preparations to be made against the Spanish Armada, was rejected by the queen. He did much to encourage American colonisation. He died deeply in debt, April 6, 1590, and was buried in S. Paul's cathedral. His official papers and correspondence are preserved among the government archives and at Hatfield. A surviving daughter, Frances, married successively Sir Philip Sidney, Robert Devereux, 2nd earl of Essex, and Richard de Burgh, 4th earl of Clanricarde. *Consult* Mr. Secretary Walsingham and the Policy of Queen Elizabeth, C. Read, 1925.

Walsingham, THOMAS (d. c. 1422). English chronicler. A monk of St. Albans and prior of the monastery of Wymondham, 1394-1400, he was the compiler of a *History of England*, written in Latin, covering the years 1272-1422. He also wrote *Chronicon Angliae*, a history of the period 1328-88, and a history of the abbots of St. Albans.

Walter. Name of an English family, several of whom became controllers of *The Times* (*q.v.*)



John Walter,
British newspaper
proprietor

newspaper. John Walter I (1739-1812) was the son of a London coal merchant. He carried on his father's business, 1755-81; was an underwriter, 1770-82; became bankrupt through shipping losses; acquired Henry Johnson's logotype printing patent, and, with money presented by creditors on the settlement of his bankruptcy, 1784, bought Printing House Square (*q.v.*). There he started a printing business, and on Jan. 1, 1785, started *The Daily Universal Register*, the name of which was altered, on its third birthday, to *The Times* or *Daily Universal Register*, and March 18, 1788, to

The Times. Walter retired 1795, dying at Teddington, Nov. 16, 1812.

John Walter II (1776-1847), son of the above, was born Feb. 23, 1776, and educated at Merchant



John Walter II,
British newspaper
proprietor

Taylor's and Trinity College, Oxford. He became joint manager of *The Times* about 1797; sole manager, 1803; and editor, 1803-10. He recruited a brilliant staff of writers on whose anonymity he insisted. He bought Bear Wood, Berks, for which co. he was M.P., 1832-37. He also sat for Nottingham, 1841; and died July 28, 1847. His 3rd son, Sir Edward (1823-1904), founded the Corps of Commissioners.

John Walter III (1818-94), eldest son of the above, went to Eton and Exeter College, Oxford, and was called to the bar at Lincoln's Inn, 1847, in which year he became sole manager of *The Times*. He introduced the Walter machine, 1869; was M.P. for Nottingham, 1847-59, and Berks, 1859-65 and 1868-85; and died at Bear Wood, Nov. 3, 1894. Chief proprietary interest in *The Times* passed to a younger son, Arthur (1846-1910), during whose lifetime the control of the paper passed to Viscount Northcliffe (*q.v.*). The name John Walter continued to be known on the board, the fourth bearer of it (b. 1873), being a director from 1910.

Walter, BRUNO (b. 1876). German-born American musician. He was born in Berlin, Sept. 15, 1876, and received his musical education at the Berlin conservatory. An able pianist, he soon turned his attention to conducting, and was appointed conductor at the Cologne opera house in 1893. Later attached to other opera houses, *e.g.* those of Riga, Berlin, and Vienna, from 1913 to 1922



John Walter III,
British newspaper
proprietor



Bruno Walter,
American musician

he was musical director at Munich. His fame was by this time world-wide, and he conducted the first season of German opera to be given after the First Great War at Covent Garden, 1924. With the advent of Hitler to power, he dropped out of the musical life of Germany, and in 1938 he became a French and in 1946 an American citizen. In 1947 Walther became musical adviser to the New York Philharmonic orchestra. He continued to conduct in many parts of the world. His autobiography, *Theme and Variations*, appeared in 1947.

Walters, OR **WALTER**, **LUCY** (c. 1630-58). Mistress of Charles II when he was prince of Wales.



Lucy Walters,
Mistress of Charles II

Daughter of a South Wales squire, she came to London during the troubles of 1644 and went to The Hague, where she became the mistress of Prince Charles in 1648. Described by Evelyn as "brown, beautiful, bold but insipid," she lived with Charles until 1650, and after many disreputable adventures died as a Paris prostitute. She bore Charles a son, James, created duke of Monmouth (q.v.). Consult *Lucy Walters, Wife or Mistress?*, Lord George Scott, 1948.

Waltham. City of Massachusetts, U.S.A., in Middlesex co. It stands on the Charles river, 10 m. W. of Boston, and is served by the Boston and Maine rly. The biggest watch factory in the world was founded here in 1854. Waltham manufactures also church organs, motor vehicles, bicycles, aircraft, and iron and brass ware. It was settled in 1640, and became a city in 1884. Pop. 40,020.

Waltham Abbey. Historic church in the urban dist of Waltham Holy Cross, Essex, England. Originally cruciform with central tower, it was set up in 1060 on an earlier foundation, by Harold, who is believed to have been buried here. Henry II converted it into a priory, dedicated to the Holy Cross and S. Lawrence, and it became an abbey in 1184. It was surrendered to Henry VIII in 1540, Tallis being then the organist. The existing building includes seven bays of the old nave, with triforium, clerestory, aisles, chapel, and crypt. The W. tower was built in 1556-58. Restoration was

carried out in 1860, 1876, and 1905. The church contains mural brasses and other monuments, as well as the stocks, whipping post, and pillory.

Waltham Cross. District of Herts, England. Part of the urban dist. of Cheshunt, it lies in the S.E. border of the co., 12½ m. by rly. N. of Liverpool Street, London. The Eleanor Cross erected by Edward I has been frequently restored. Close to it is the Four Swans inn, which originally belonged to the above abbey of Waltham, Essex, and is said to date from 1260.

Waltham Holy Cross. Urban dist. and town of Essex, England. An old market town, in the valley of the Lea, its history begins in the days of Canute. Its chief industries are concerned with horticulture under glass, plastics, chemicals, and scientific research. Its most notable feature is Waltham Abbey (q.v.). Pop. approx. 8,000.

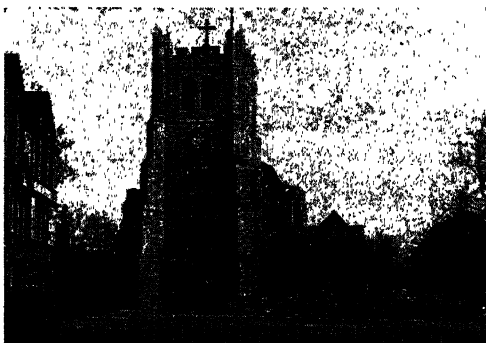
Walthamstow. Borough of Essex, England. Part of Greater London, it is excellently served by rly. and bus. Its oldest church is the parish church of S. Mary, partly rebuilt in 1537, enlarged and restored 1817, 1843, and 1876, and containing old brasses. The new town hall is a handsome building. The grammar school was founded in 1527. William Morris was born in a house called The Winns, near



Waltham Cross, Herts.
Eleanor Cross, erected by
Edward I



Waltham Holy
Cross arms



Waltham Abbey, Essex. West tower, added to the remains of the ancient church of Holy Cross in 1556-58

Lloyd's Park, which, opened in 1900, is now a recreation ground. Walthamstow, made a borough in 1929, elects two M.P.s. Pop. est. 124,380.

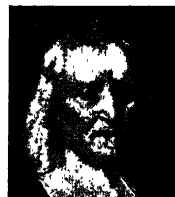
Walther VON DER VOGELWEIDE (c. 1168-c. 1230). German poet. Born near Sterzing, in Tirol, he studied the minnesinger's or wandering minstrel's art under Reinmar the Old, at the ducal court in Vienna. From 1198 he wandered from court to court, living in extreme poverty, his bitter satirical

verses having earned him more enemies than friends. His patriotic poems, however, won the patronage of Frederick II, from whom he received a fief near Wurzburg, where he is buried. Walther's love lyrics are among the most beautiful in the language, and he also widened the repertoire of the subjects used by minnesingers. In his best political poems, together with ardent patriotism he expresses the feelings of the empire in the struggle against papal supremacy. Some poems were trans. by W. Alison Phillips, 1896.

Walton,

I Z A A K
(1593-1683).

English writer. Born at Stafford, Aug. 9, 1593, the son of a yeoman, he was apprenticed to a London ironmonger, and after a successful



Isaac Walton.
After J. Huysman

business life in Fleet Street and Chancery Lane, he retired to Shallowford, Staffs, about 1644. He returned to London in 1650, lived with Bishop Morley at Farnham Castle, where he wrote his *Lives of Hooker and Herbert*, and then with his son-in-law, Canon Hawkins, at Winchester,

where he died Dec. 15, 1683, being buried in the cathedral. He was married first to Rachel Floud, a descendant of Cranmer, and later to Ann Ken, half-sister to Bishop Ken. London anglers erected a window to his memory in the church of S. Dunstan-in-the-West in 1895.

Walton's *Lives of Donne*, 1640; Wotton, 1651; Hooker, 1662; Herbert, 1670; and Sanderson, 1678, are among the most delightful of English biographies. He was himself not negligible as a poet. His *Compleat Angler* (*q.v.*), 1653, was the first and is still a most popular English nature book. The second part was added by Walton's friend Charles Cotton in 1676.

Bibliography. *Lives*, H. Nicholas, 1823; R. B. Marston, 1888; editions of *The Compleat Angler*, R. Le Gallienne, 1897; A. Lang, 1906; T. Balston and A. B. Gough, 1915; J. Buchan (*World's Classics*), 1935; *Walton's Lives*, ed. A. H. Bullen, 1884; G. Sampson, 1903; *The Compleat Walton*, ed. G. Keynes, 1929.

Walton, WILLIAM TURNER (b. 1902). British composer. Born at Oldham, March 29, 1902, he was



William Walton,
British composer

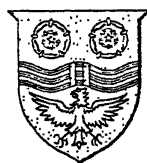
educated at Christ Church, Oxford, and, apart from composition lessons from Hugh Allen and advice from Busoni, wasself-taught. In 1923 his first

string quartet was performed at Salzburg. Walton settled in London and collaborated with Edith Sitwell in the latter's *Façade*, pieces for declamation and chamber orchestra which were later arranged as two orchestral suites and as a ballet. In 1934 his symphony in B flat was performed in London before completion, the finale being added next year. With striking originality Walton blended a vigorous quality allied to all that was best in the English tradition. Important works include the overture *Portsmouth Point*, 1926; *Sinfonia Concertante*, 1927; *Beshazzar's Feast*, for chorus and orchestra, 1931; concerto for viola, 1929; another for violin, 1939; *In Honour of the City of London*, 1937; *The Quest* (ballet), 1943; violin sonata, 1950; music for the films of Henry V and Hamlet.

Walton-le-Dale. Urban dist. and parish of Lancs, England. It is situated on the Ribble, 2 m. S.E. of Preston, and served by rly. The parish church of S. Leonard was founded in the 12th century. The chief business of the town is cotton

spinning, ironfounding, and market gardening. Pop. 12,810.

Walton-on-Thames. Part of the urban dist. of Walton and Weybridge, in Surrey, England.



Walton-on-Thames arms

Built on the S. bank of the Thames, 5 m. S.W. of Kingston, Walton is largely a residential suburb of London, with which there is rly. connexion. The Norman church of S. Mary contains interesting monuments and a curiosity in the shape of a scold's bride, bearing the date 1632. In the neighbourhood are Walton Manor, where Bradshaw the regicide lived, Oatlands (*q.v.*), and Ashley Park, built by Wolsey and for some time the residence of Oliver Cromwell. In the parish are the waterworks of the W. Surrey Water co. Pop. est. 29,230. See Weybridge.

Walton-on-the-Hill. Village in Surrey, England, 5 m. N.W. of Reigate. The ancient church dedicated to S. Peter, contains a remarkable 12th century lead font. In the 20th century the golf course laid out on Walton Heath began to attract residents, and numerous villas were built around it.

Walton-on-the-Naze. Urban dist. and seaside resort of Essex, England. Part of the dist. known as the Soken, it is 7½ m. S. of Harwich, and is a rly. terminus. Standing on the Naze, and almost surrounded by the sea, it has excellent bathing and boating facilities, while Walton Creek, a large expanse of water, affords excellent wild duck shooting. Formerly a town of some importance, Walton has been much reduced by the encroachment of the sea. The old parish church of All Saints with the neighbouring houses was engulfed in 1798. Besides catering for visitors, the main occupation is fishing. Pop. 3,171.

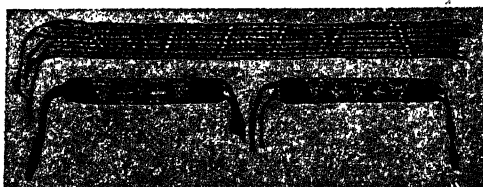
Waltz (Ger. *walzen*, to revolve). A dance, the music to which is written in 3/4 time, though, as two bars are necessary to complete the movement, the time really is not simply treble, but compound duple. Its origin is somewhat obscure, but probably came from S. Germany or Bohemia. It first appeared in the 18th century, and although fierce attacks were made upon

it in various quarters for its alleged indelicacy and lack of grace, it soon conquered the dancing world. The form was used by Chopin, Brahms, Tchaikovsky, and other composers as a medium for instrumental music, and the compositions of Johann Strauss and others of the Viennese school were intended to be more than the mechanical accompaniment to a dance. The modern waltz is played at half the speed of the original dance.

Walvis Bay. Seaport in the South-West Africa protectorate. It is 21 m. S. of Swakopmund, which it has now superseded, and forms the only good harbour on that coast, being the point of export for 95 p.c. of S.W. African trade. For political reasons it was retained by Great Britain when the Germans assumed a protectorate over the adjacent hinterland, and from 1878 until the First Great War it was a detached part of the Cape of Good Hope. A wall 3½ m. long protects the town (part of which is 4 ft. below sea-level). A 1,500-ft. wharf was constructed in 1928. Pop. 1,992.

Walworth. Dist. of London. It is in the bor. of Southwark (*q.v.*), E. of Newington and S.W. of Bermondsey. The church of S. Peter, 1825, is associated with the work of Canon Horsley (1845-1922). In the dist. is the Browning Settlement (*q.v.*). Walworth Road runs S. from the Elephant and Castle (*q.v.*) to Camberwell Road. Walworth, mentioned in Domesday, is believed to have been the birthplace of Sir William Walworth (d. 1385; see Tyler, *Wat*). An overcrowded, working-class district, it suffered heavy damage from German bombs in the air raids of 1940 and 1944.

Wampum (Algonquian *wompi*, white). Shell beads strung for ornament, currency, and tribal records by some N. American Indian peoples. Made of the perforated central column of several kinds of marine shells, they became the recognized medium of exchange with the early white settlers. The Iroquois preserved treaty records and the like mnemo-



Wampum. Two strings of shell beads used as money, and an ornamental wampum belt, made by Iroquois Indians
By courtesy of the Trustees, British Museum

nically on wampum belts up to 3 ins. wide. Longfellow's *Hiawatha* contains a reference to running shoes of wampum.

Wanamaker, JOHN (1838-1922). American merchant. Born in Philadelphia, July 11, 1838, he became a bookseller's errand-boy, and in 1856 a retail clothier. This business developing into a huge concern with a branch in New York. Wanamaker started the Bethany Sunday school in 1856, was a founder of the Christian Commission during the Civil War, and was president of the Philadelphia Y.M.C.A., 1870-83. He also founded colleges, and Y.M.C.A. branches in the Far East. In politics a Republican, he was postmaster-general, 1889-93. He died Dec. 11, 1922. *Consult* Lives, H. A. Gibbons, 1927; J. H. Appel, 1931.

Wand, JOHN WILLIAM CHARLES (b. 1885). British prelate. Born Jan. 25, 1885, he went to the King's School, Grantham, and S. Edmund Hall, Oxford. His first curacy was at Benwell, and in the First Great War he was vicar-choral of Sarum and a chaplain to the forces. He next held the vicarage of S. Mark, Sarum, and was a theological tutor there, and after 1925 at Oriel College, Oxford. In 1934 he went out to Queensland as archbishop. Returning to England, he was given in 1943 the see of Bath and Wells, whence he was transferred two years later to London in succession to Dr. G. F. Fisher. A zealous High Churchman, Bishop Wand published *Development of Sacramentalism*, 1928; *History of the Modern Church*, 1930; *History of the Early Church*, 1937; *New Testament Letters*, 1944; *God and Goodness*, 1947. *See* Bishop, illus.

Wandering Jew, THE. Legendary character condemned to wander about the earth until the second coming of Jesus Christ. According to the story told by Matthew Paris (d. 1259), the Jew, doorkeeper to Pilate, told Jesus to go faster when He was led out to be crucified, whereupon Jesus replied, "I go, but thou shalt wait until I return." The story reappears in the *Chronique Rimée* of Philippe Mouskes (d. 1283), bishop of Tournai. A German version, current at the beginning of the 17th century, gives the Jew the name of Ahas-

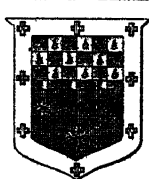
uerus, a shoemaker in Jerusalem, who, when Jesus desired to rest by his shop, bade Him move on, and to whom Jesus said, "I will stand here and rest, but thou shalt go on until the last day." There are other variations of the legend, which has Greek and Teutonic parallels, and has led to the appearance of more than one impostor. A play of this name, by E. Temple Thurston, in which Matheson Lang took the title-rôle, was produced at the New Theatre, London, Sept. 9, 1920. *Consult* The Wandering Jew, M. D. Conway, 1881; poetical versions by Goethe, A. W. von Schlegel, C. Norton, and R. Buchanan; novels by Croly and Sue.

Wanderoo. Species of langur, a long-tailed monkey found in Ceylon. It is greyish in colour, and is sometimes protected as sacred. The name is also applied to the lion-tailed monkey (*Macacus silenus*), a species of macaque found in W. India, with a huge grey ruff around the sides of its face.

Wandewash. Town of India, in N. Arcot dist., Madras state. It is situated in the S.E. of the dist. Here Eyre Coote defeated Lally on Jan. 22, 1760, and gained the most important victory ever won over the French in India.

Wandle. Small river in Surrey, England. Rising in the hills above Carshalton, it flows through Beddington and Mitcham into the Thames near Wandsworth Bridge. There are paper-making works on its banks.

Wandsworth. Largest met. bor. in the co. of London. Named after a Thames tributary, the



Wandsworth arms

Wandle, and covering an area of 14½ sq. m., with 20 wards, it includes the dists. of Wandsworth proper (with Southfields and Garratt), Putney, Tooting, Balham, Streatham, and part of Clapham. It touches Surrey on the W. and S. Part of Wandsworth Common, which covers 183 acres and was transferred from the conservators to the metropolitan board of works in 1887, is in Battersea (q.v.). Here are Wandsworth prison, 1851; Royal Victoria Patriotic school, transformed into a military hospital during the First Great War and now Wandsworth training college; and Emanuel school. Wandsworth Park, 20½ acres, on the right bank of the Thames, was opened in 1903.

An ancient suburb once called Wendelsworth, this was a resort of Huguenot refugees, whose burial ground on East Hill contains many notable names. Wandsworth and Putney Bridges connect with Fulham. Comparatively lightly damaged in raids by piloted aircraft, 1940-44, Wandsworth was hit by more flying bombs than any other London borough. Wandsworth is divided into four bor. constituencies. Pop. est. 338,000.

Wanganui. River of New Zealand, in North Island. It rises at the foot of Mt. Tongariro, and flows after a course of 200 m. into Cook Strait on the S.W. coast. Steamers can reach the port of Wanganui, 4 m. from the bar at the mouth, and smaller craft penetrate 140 m. upstream.

Wanganui. A city of New Zealand, in Wellington dist., North Island. On the Wanganui river, 134 m. by rly. N. of Wellington, it is the centre of an agricultural and pastoral area, and exports cattle, sheep, grain, and wool. Population 27,600.

Wangaratta. A town of Victoria, Australia, in Moira co. At the confluence of the Ovens and King rivers, it is an agricultural centre, 146 m. by rly. N.E. of Melbourne, on the line to Sydney. Pop. 5,700.

Wankie. A settlement of S. Rhodesia. It is 212 m. N.W. of Bulawayo by the Cape to Cairo rly., and is the centre for the Wankie coalfields situated on the Gwaai river. The discovery of coal here caused Rhodes to divert the rly. from the direct line to the N. Water is scarce, and is pumped from Deka, 7 m. W.

Wanlockhead. Highest inhabited village of Scotland, 1,380 ft. above sea level. It is in Dumfriesshire, 6 m. E.N.E. of Sanquhar, on the border of Lanarkshire. It was known for its lead mines, first worked about 1680, but closed down in 1934. In 1948 a master radar station for Scotland was built at an elevation of 2,403 ft. on the summit of the Lowther Hills near the village. Pop. 300.

Wanstead. Part of the urban dist. of Wanstead and Woodford, Essex, England. On the S. margin of Epping Forest (q.v.), it has rly. stations at Snaresbrook and Wanstead Park. A park of 200 acres, acquired for the public by the City Corporation in 1880, contains several lakes and a heronry. Here during 1715-1822 stood Wanstead House, a mansion built by the

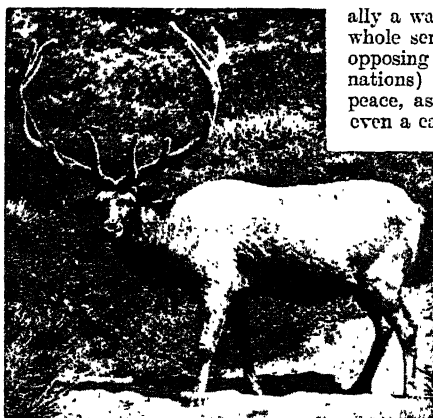
1st Earl Tylney, and for a time the residence of Louis XVIII and the prince of Condé. Wanstead Flats extend S. towards Forest Gate. The church of S. Mary was rebuilt in 1790. Pop., with Woodford, 60,000.

Wantage. Market town and urban dist. of Berks, England. It is 25 m. N.W. of Reading and 60 m. W.N.W. of London. Wantage Road is a station $2\frac{1}{2}$ m. away. The chief building is the church of SS. Peter and Paul, mainly Perp. in style; it retains some parts of an E.E. edifice, and has notable brasses and other memorials. There are a grammar school, and a gallery containing pictures of deeds that won the V.C., presented by Lord Wantage, who himself received that award in the Crimean War. During and after the Second Great War this gallery was a food ministry depot. Wantage is famous as the birthplace of Alfred the Great, to whom there is a statue in the market place, and in whose honour schools have been built. It has an agricultural trade. Near is the Vale of the White Horse. Pop. 5,355.

The town gave the title of baron in 1885 to Robert James Loyd Lindsay, Conservative M.P. for Berks, 1865-85, and during 1877-80 financial secretary to the War office. He died without an heir, June 10, 1901, and his monument stands on the Ridgeway.

Wanyambo. Primitive negroid people of Bantu speech in the Karagwe dist., Tanganyika Territory. They represent a widespread aboriginal stock allied to the Bahutu of Ruanda, and the Bairo of Ankole, Uganda. Of medium stature, dark, and full-lipped, they are an agricultural people who have been overrun and dominated by immigrant Batusi. See Mpororo.

Wapentake (Old Norse *váp-natak*, touching of weapons). Name given to a division of certain English counties. It corresponds to the hundred (*q.v.*) elsewhere, and occurs in the shires of York, Lincoln, Leicester, Nottingham, Derby, and Rutland, although in some of these the word hundred is also used. The theory is that wapentake is the Danish equivalent for the hundred, as the word is found only in parts settled by this people. It was used for a meeting before it became the name of a district, and originated in the ceremony of touching the chief's spear as a sign of homage. Like the hundreds, the wapentakes vary in size, and in early times had their own courts of justice. See County.



Wapiti. Large Californian deer, showing the characteristic branching antlers and heavily built body
Gambier Bolton, F.Z.S.

Wapiti (*Cervus canadensis*). A species of large deer. Allied to the British red deer, but larger in size, it occurs in N. America, though rarely now outside reservations, and in Central and N.E. Asia. The body is a light reddish brown, the head and limbs darker. The wapiti is mainly distinguished by the fine development of its antlers (*q.v.*).

Wappers, EGIDE CHARLES GUSTAVE, BARON (1803-74). Belgian painter. Born at Antwerp, Aug. 23, 1803, he studied there and in Paris. He painted Flemish history in the Romantic manner, and became a leader of the artistic revolt in Belgium against classicism. Painter to the king and director of the Antwerp academy, he died in Paris, Dec. 6, 1874. Charles I Taking Leave of his Children is a well-known picture by Wappers.

Wapping. London dist. Part of the bor. of Stepney (*q.v.*), it lies between the London docks and The Pool, being connected with Rotherhithe by the Thames Tunnel. Near the High Street are the Old Stairs of Dibdin's ballad. The recreation ground, $2\frac{1}{2}$ acres, in Tench Street, was opened in 1891. Near the Tunnel Pier was Execution Dock, where pirates were hanged at low-water mark and left until three tides had flowed over them.

War (O.Fr. *werre*). State of conflict, the opposite of peace. It was defined by Clausewitz as "a continuation of political intercourse with a mixture of other means," such other means usually implying the use of arms and the taking of human life, but not invariably so. "Other means" may be taken as including the use of an economic blockade or such subtler means as are implied in the phrases "war of nerves" or "cold war." Historically

a war is the name given to a whole series of operations by the opposing parties (not necessarily nations) between two periods of peace, as distinct from a battle or even a campaign, which represent

only part of the operations. Such wars have usually been preceded by a declaration of a state of war by one or both of the parties; but the later tendency has been to dispense with this formality as did Japan in opening hostilities against China in 1931 and Germany in her successive invasions of Poland, Norway, and the Netherlands and Belgium, 1939-40. In Germany's

attack on the U.S.S.R., 1941, and in Japan's attacks on U.S. and British territory later the same year, hostile acts preceded the declaration. Various attempts have been made to draw up rules and conventions for fighting wars, but in "total" war, demanding the whole activity and energy of a nation or group of nations engaged in a life-and-death struggle, such rules and conventions tend to be observed only when it is expedient to do so; for example, all combatants of the Second Great War refrained from using poison gas, as its disadvantages might well have outweighed its advantages. Poison gas played the part of an effective surprise in the First Great War, as the flying bomb, rocket bomb, and atomic bomb did in the Second. Bacteriological weapons might have proved equally effective. One weapon is no less inhuman than another; indeed, any attempt to "humanise" war has been shown to be futile. War itself has become the great enemy of mankind, and the struggle to avoid it one of mankind's continuous pre-occupations.

Throughout this Encyclopedia the two wars of 1914-18 and 1939-45 are referred to respectively as the First Great War and the Second Great War; and full accounts are given under these headings. Other wars, ancient and modern, are dealt with under appropriate headings. See also Air Power; Army; Battle; Fortification; Sea Power; Strategy; Tactics, etc.

War, RULES OF. Rules under the law of nations relating to war can be traced back at least as far as the Middle Ages, but their main growth started about 1850. Their object has been to prohibit acts

of violence not necessary to the attainment of an object by a belligerent. Thus they prohibit killing prisoners or wounded. Until the middle of the 19th century the chief basis of such rules was custom and usage, but since then they have been laid down in international conventions. The declaration of Paris (1856) abolished privateering and regulated contraband; the Geneva convention (1864, revised 1906 and 1929) protected the wounded; the declaration of St. Petersburg (1868) prohibited explosive bullets; the Hague convention (1899, revised 1907) set out the laws of war on land; the Hague declaration (1899) related to dum-dum bullets and projectiles launched from balloons or containing gas; the Hague conventions (1907) concerned laying mines, naval bombardment, and rights of neutrals; the protocol of a conference convened by League of Nations (1925) related to poison gas; the Geneva convention (1929) further protected the wounded and prisoners; the London protocol (1936) discussed the use of submarines against merchant ships. See Geneva Convention in N.V.

War and Peace. Novel by Leo Tolstoy, one of the longest and greatest novels ever written. It is a narrative of the Napoleonic campaign against Russia, culminating in the advance to Moscow and retreat therefrom in 1812. Parallel with the sweeping course of great historical events runs the story of one group of imaginary individual Russians. The theme of the book, constantly stated and illustrated, is that success and failure in historic events depend not on the will and genius of individual leaders but on the conformity of those leaders to elemental truths expressed in those events. There are several English translations of the novel, notably that by Constance Garnett; and as the book appears to reflect something of the psychology of the Russian people it had a new lease of popularity in Great Britain when Russia became an ally during the Second Great War. A radio-dramatic version was broadcast serially in 1943, and in the same year an elaborate stage version by R. Lucas was produced at the Phoenix Theatre, London, where it had only a short run. Neither of these "potted" versions conveyed any sense of the epic grandeur of Tolstoy's work.

Waratah or Warratau (*Telopos speciosissima*). Shrub of the

family Proteaceae. A native of Australia, it has dense tufts of long oval leaves, springs a head of brilliant crimson tubular flowers. It shares with the wattle (*Acacia*) the distinction of being the national flower of Australia, and for this reason is in danger in some districts of being exterminated as a wild plant, so great is the demand for its flowers for decoration.

Waratah. British steamship, belonging to the Blue Anchor line. She left Durban for Cape Town, July 26, 1909, and was never heard of again. A board of trade inquiry two years later, which lasted 15 days, found that the vessel probably capsized in the gale of July 28, but no cause could be determined.

Waratah. Mining centre of Tasmania, Australia. In Russell co., it is 82 m. E. of Launceston, and is noted for its tin mines, especially the rich Mt. Bischoff mine. Gold and silver are also found in the neighbourhood. Another Waratah is a mining suburb of Newcastle, N.S.W.

Warbeck, PERKIN (c. 1474-99). Pretender to the English throne. Son of a Fleming named Wer-



Perkin Warbeck, pretender to the English throne

becque, he spent his youth at Antwerp. In the service of a silk merchant named Meno, he went to Cork in 1491, and next year proclaimed himself duke of York, the younger son of Edward IV supposed to have been murdered in the Tower. The Yorkist faction pressed his claim and he was acknowledged by the French, Imperial, and Scottish courts. In 1495, backed by the emperor Maximilian, Warbeck attempted landings in Kent and Ireland, and James IV of Scotland gave him to wife Catherine Gordon, daughter of the earl of Huntly and James's own cousin. Coming ashore again at Whitesand Bay, Cornwall, he proclaimed himself Richard IV, Sept. 7, 1497. Attended by an army of rustic malcontents, he marched inland, but was defeated at Exeter, surrendered, and in 1498 publicly

confessed his imposture at Westminster and Cheapside. After an attempt to escape from the Tower, he was hanged at Tyburn, Nov. 23, 1499. Some have held the theory that Warbeck was an illegitimate son of Edward IV (whom he seems to have resembled) born when that monarch had fled to Flanders.

Warble. Cyst formed in the back of the ox by the larvae of bot-flies (*Hypoderma lineata* and *H. bovis*). See Bot-fly.

Warbler. Popular name for insectivorous birds of several genera in the family Sylviidae. Eleven species breed in Great Britain, where nine others are occasional visitors. In general structure resembling the thrushes, they are distinguished from that family mainly by the nestlings being without spotted plumage. The true warblers of the genus *Sylvia*



Warbler. The Wood Warbler
W. S. Berridge, F.Z.S.

are represented in Great Britain by the whitethroat (*S. communis*), summer visitant to the British Isles, lesser whitethroat (*S. curruca*), blackcap (*S. atricapilla*), and garden warbler (*S. borin*).

The Dartford warbler (*S. undata*) is resident in the S. counties wherever there are heaths. The genus *Phylloscopus* includes the chiffchaff (*P. collybita*), the willow-warbler (*P. trochilus*), and the wood-warbler (*P. sibilatrix*). The genus *Acrocephalus* has two British representatives, the sedge-warbler (*A. schoenobaenus*) and the reed-warbler (*A. scirpaceus*), water-side birds that nest among the reeds and sing through the night. The grasshopper warbler (*Locustella naevia*) is more a bird of the hedgerow whose song has suggested its name. A second species, Savi's warbler (*L. luscinioides*) bred regularly in the reed-beds of the East Anglian fens before their drainage. See Black Cap; Eggs colour plate; Nest.

Warburg, OTTO HEINRICH (b. 1883). German physiologist, born at Freiburg, Oct. 8, 1883, son of the physicist Emil Warburg (1846-1931). From 1914 a member, he was from 1930 director of the Kaiser Wilhelm Institute of cellular physiology. He specialised in the chemistry of the living cell and made fundamental discoveries as to breathing, fermentation, and the assimilation of carbonic acid; he found out vital principles of metabolism, and showed the biological characteristics of the cells of tumours. For these discoveries he was awarded the Nobel prize for medicine in 1931, and made a foreign member of the R.S. He dealt with heavy metals as affecting fermentation in a publication of 1946.

Warburton, WILLIAM (1698-1779). British divine and scholar. Born at Newark, Dec. 24, 1698, he was educated at the grammar school there. After a few years as a lawyer, he was ordained in 1723. Chosen rector of Brant-Broughton in 1728, he was made preacher at Lincoln's Inn in 1746, dean of Bristol in 1757, and in 1759 bishop of Gloucester, remaining there until his death, June 11, 1779.



William Warburton,
British divine
After Hoare

Deeply learned in theology, Warburton made a brilliant attack on deism in *The Divine Legation of Moses*, 1737-41; and a less successful one on Methodism in *The Doctrine of Grace*, 1762. He defended the principles of Pope's *Essay on Man*, and in an edition of Shakespeare corrected Pope's errors. Though a formidable controversialist, he sometimes spoilt his case by lack of restraint. Consult W. and the Warburtonians, A. W. Evans, 1932.

War Charities, LAW RELATING TO. By the War Charities Act, 1940, it is illegal, except in a place of public worship, to appeal for donations or subscriptions in money or kind for any war charity unless it is registered with the local authority or exempted from registration. This Act not only applied to the Second Great War, but may be extended by Order in Council to apply to any war.

War Correspondent. Name given to a reporter from a newspaper or a broadcasting organization delegated during a war to

collect and send home from day to day news of the fighting from the battlefield or its immediate vicinity. During the Second Great War the term was extended to include photographers. The problem for a war correspondent is to reconcile military need for secrecy with public demand for accurate news. H. C. Robinson (*q.v.*) is generally regarded as the first war correspondent. W. H. Russell (*q.v.*) reported the Crimean War and the American Civil War for British readers. Winston Churchill (*q.v.*) first earned fame as a war correspondent. Whitelaw Reid (*q.v.*), who reported the Civil War, and Richard Harding Davis, who reported every war from the Graeco-Turkish war of 1897 to the First Great War, were notable American correspondents.

In both Great Wars reporters came under military control—in the Second as commissioned officers. Their dispatches were rigorously censored to prevent risk of a repetition of such a position as that of which Wellington complained in 1809 when, he said, the newspapers described "the position, numbers, objects, and means of attaining them, possessed by the armies in Spain and Portugal." Increasing restriction of freedom was accompanied by increasing personal danger, particularly in the Second Great War when broadcasting led to the call for eye-witness accounts of actions actually being fought. Notable war correspondents of the First Great War included H. Hamilton Fyfe, Philip Gibbs, H. W. Nevinson, Percival Phillips, Perry Robinson, Herbert Russell, and W. Beach Thomas, all of whom except Fyfe and Nevinson accepted knight-hoods in 1920.

In the course of the Second Great War the British War office gave facilities on many fronts to 1,450 correspondents of various nationalities. Reporters, photographers, newsreel men, and broadcasters (none of whom carried arms), went in with service personnel in infantry attacks, bombing raids, parachute and glider drops, commando operations, and naval engagements; 19 British and Commonwealth correspondents were killed, many others wounded or taken prisoner; more than 20 American correspondents were killed in battle, a dozen others in accidents. The radio war reporter, making a first appearance, became much better known to the public than the newspaper reporter, Richard Dimbleby, Godfrey Tal-

bot, and Chester Wilmut being among names familiar to every listener to B.B.C. wartime broadcasts. Stanley Maxted, a B.B.C. Canadian broadcaster, who landed with the airborne forces at Arnhem, gave a moving account of that operation from within it; Ed Murrow, the American commentator, sent over the air the unforgettable story of the entry into Belsen camp. Hundreds of other men ran similar risks to collect information for press and radio in the rapid and violent land, sea, and air activities of the Second Great War.

War Crime. Act committed by an individual for which he may be punished by his opponent. These crimes have long been held to include (1) acts by members of the armed forces violating the recognized rules of war—*e.g.* using poison or other prohibited weapons or ill-treating prisoners; (2) hostile acts by persons not in the armed forces—*e.g.* attacks by civilians; (3) war treason, *i.e.*, acts by persons in occupied territory injurious to the occupying power—assisting prisoners to escape, damaging lines of communication, supplying information; (4) marauding, looting, etc.; (5) spying.

The term was declared to have a wider meaning by the agreement of London in Aug., 1945, made between Great Britain, the U.S.A., France, and Russia, which recognized (a) crimes against peace, *e.g.* planning a war of aggression; (b) war crimes proper, *e.g.* violation of the laws of war; (c) crimes against humanity, *e.g.* inhumane acts committed against a civilian population even in time of peace.

All war crimes are punishable by death, though a lesser punishment may be inflicted. After the First Great War the treaty of Versailles provided that the German govt. recognized the right of the Allies to bring war criminals to trial; but when the Allies demanded the surrender of nearly 900 persons, including many of the most famous names in Germany, it was declared impossible to arrest and surrender them. In the end several persons were tried by the German supreme court in Leipzig. Many were convicted of ill-treating prisoners and sinking hospital ships, and sentences of imprisonment were imposed. The German emperor had been arraigned for a "supreme offence against international morality and the sanctity of treaties"; but as

he was in exile in the Netherlands and the Dutch govt. refused to surrender him, he was never brought to trial.

After the Second Great War the same difficulties did not arise, as all German and Japanese territory was occupied by the victors. In 1942 the Allied powers (excluding the U.S.A. and Russia) had placed among their war aims "the punishment, through the channels of organized justice," of those guilty of war crimes. Similar action was taken separately by the U.S.A. and Russia, and a joint declaration was made at Moscow in 1943 by Great Britain, the U.S.A., and Russia. The London agreement of 1945 set up an international tribunal for the trial of the major war criminals, which took place in Nuremberg. Similar trials of major war criminals in Japan ended in 1948.

Various objections both practical and legal have been raised to the trial of war criminals. It is pointed out that of necessity only the war crimes committed by members of the defeated state are punished; it cannot be expected that the victorious state will allow the defeated state to try members of the former. It has been questioned by some lawyers whether the acts committed by the Nazis, however morally wrong, were crimes by international law. It was never contended that the London agreement could make these acts criminal, for the acts alleged to be crimes were all committed before that time; and it is a fundamental principle of natural justice that a person cannot be punished for an act which was not a crime under the law in force when it was done. Further, the parties to the agreement did not claim to be an international legislature; they were declaring existing law, not making new law. It was questioned whether international law applied to individuals or only to states. One of the most difficult questions connected with war crimes generally is how far it is an answer for an accused person to prove that he committed the crime in pursuance of an order of his superior officer. The London agreement excluded this plea as a defence, while providing that it might be taken into account to mitigate punishment. See Nuremberg Trials; Tokyo Trials. See also Belsen; Genocide; Oswiecim.

Ward. In English law, a child under wardship or guardianship.

In certain circumstances an infant (in the legal sense) becomes a ward of court, i.e. under the protection of the high court.

Ward. In English local government, an electoral division of a municipal borough or parish. In each ward the electors whose names are inscribed in the ward rolls elect councillors.

Ward, SIR ADOLPHUS WILLIAM (1837-1924). British historian and critic. Born at Hampstead, Dec. 2, 1837, he was educated at Bury St. Edmunds and Peterhouse, Cambridge, of which he was a fellow. In 1866 he became professor of history and literature at Owens College, Manchester, where during 1890-97 he was principal. In 1900 he was made master of Peterhouse, and in 1913 was knighted. An authority on German history, Ward was one of the editors of the Cambridge Modern History. He wrote *History of English Dramatic Literature to the Death of Queen Anne*, 1875; *Lives of Chaucer*, 1880, and *Dickens*, 1882; and was part editor of the *Cambridge History of English Literature*. In 1911-13 he was president of the British Academy. He died June 19, 1924.

Ward, ARTEMUS (1834-67). Pseudonym of Charles Farrar Browne, American humorist. Born



Artemus Ward,
American humorist

at Waterford, Maine, April 26, 1834, he became a compositor and reporter. As Artemus Ward, Showman, he contributed to *The Cleveland Plain Dealer* a series of ungrammatical and misspelt letters describing the adventures of an imaginary travelling menagerie. These letters became so popular that in 1860 the author was invited to become editor in New York of *Vanity Fair*, a new comic paper. As this failed, Artemus Ward began in 1861 a career as lecturer, discoursing on the Indians and Mormons, and adding a panorama to the lecture. In 1866 he visited England and produced his panorama in London. He died at Southampton, March 6, 1867. His best-known works are *A. W.: His Book*, 1862; *A. W.: His Travels*, 1865; *A.W. in London*, 1867. They were collected with memoirs ed. M. D. Landon, 1875.

Ward, EDWARD MATTHEW (1816-79). British painter. Born in London, he studied under John

Cawse at the R.A. schools, and in Rome and Munich under Cornelius. He helped to decorate the house of commons, and painted scenes from 17th and 18th century history, especially the French Revolution. A.R.A. in 1846, and R.A. in 1855, he died by his own hand, Jan. 15, 1879. He was the father of Sir Leslie Ward (Spy). See Maclise.

Ward, ELIZABETH STUART PHELPS (1844-1911). An American author. Born in Boston, Mass.,



E. S. P. Ward,
American author

Aug. 31, 1844, daughter of Professor Austin Phelps, she wrote successful short stories as a girl, and achieved wide fame in 1868 with her semi-religious novel *The Gates Ajar*.

Later books were *Hedged In*, 1870; *Beyond the Gates*, 1883; *The Gates Between*, 1887; and *Within the Gates*, 1901. In 1888 she married the Rev. Herbert D. Ward, in collaboration with whom she wrote *Come Forth*, 1890. She died Jan. 28, 1911.

Ward, DAME GENEVIÈVE (1837-1922). British actress. Born in New York, Mar. 27, 1837, she

studied operatic singing in Italy, and, having married Count C. de Guerbel in 1855, made her début under the name of Ginevra Guerbelli, at Milan, in the part of Lucrezia Borgia, 1856. She then toured in England



Dame Geneviève
Ward,
British actress

and the U.S.A., but in 1862 lost her singing voice after an attack of diphtheria, and for a time taught singing in New York. In 1873 she first appeared at Manchester as *Lady Macbeth*. Her success as a tragic actress was immediate and lasting. In the part of *Stephanie in Forget-Me-Not*, 1879, she rose to the highest point of her art. In 1893 she joined Henry Irving's and in 1910 F. R. Benson's company. With Richard Whiteing (q.v.) she wrote *Before and Behind the Curtain*, 1918, and in 1921 was created D.B.E. She died Aug. 18, 1922.

Ward, MRS. HUMPHREY. This British novelist is dealt with under her full name, *Mary Augusta Ward*.

Ward, JAMES (1769-1859). British artist. Born in London, Oct. 23, 1769, he studied engraving under



James Ward,
British artist

John Raphael Smith, but prompted by George Morland, his brother-in-law, took up painting. His animal pictures are ruggedly realistic. He became A.R.A. in 1807, R.A. in 1811, and lived until Nov. 23, 1859.

Ward, JAMES (1800-84). English pugilist. Born in London, Dec. 26, 1800, he won his first notable victory as a boxer in 1821, being nicknamed The Black Diamond. In the course of 10 years he won many fights, being recognized as English champion in 1825, and, having been beaten by Peter Crawley in 1827, again in 1831, he retired from the ring in 1832, becoming a tavern-keeper and, later, a painter in oils, his picture of the Sayers and Heenan fight, exhibited in 1860, attracting much attention. He died April 2, 1884.

Ward, JAMES (1843-1925). A British philosopher. Born Jan. 27, 1843, and educated at Spring Hill College and in Germany, he became a Congregational minister, but resigned, and in 1872 entered Trinity College, Cambridge, where, and at London university, he took the highest honours in philosophy. Fellow of Trinity, 1875, he became professor of mental philosophy at Cambridge in 1897, and in 1902 fellow of the British Academy. His chief work is *Naturalism and Agnosticism*, 4th ed. 1915. He also wrote *Heredity and Memory*, 1913, and *Psychological Principles*, 1918, in which he advanced new ideas of the meaning of experience. His view of knowledge approaches pragmatism. He died Mar. 4, 1925.

Ward, JOHN (1866-1934). British labour leader. After serving in the army he worked as a navvy, and became interested in labour questions, joining the Social Democratic Federation in 1885. He founded the Navvies' Union in 1899, and in 1906 was elected independent M.P. for Stoke-on-Trent, continuing to represent that division until 1929. In the First Great War he raised five labour battalions and became colonel of the 25th Middlesex Regiment, which he led against the Bolsheviks in Siberia. He was with this battalion on board the *Tyndareus* when it was mined. He wrote the story of the Far-Eastern campaign in *With the "Die-hards" in Siberia*, 1920. Created C.M.G. in 1918, he died Dec. 19, 1934.

Ward, JOHN QUINCY ADAMS (1830-1910). American sculptor. Born at Urbana, Ohio, June 29, 1830, he was one of the few American artists of his day trained entirely in the U.S.A. His first important statue was The Indian Hunter, 1864, now in Central Park, and other notable works are his George Washington and Shakespeare (New York), and President Garfield (Washington). He was elected a member of the National Academy in 1863, and was first president of the National Sculpture Soc. He died May 1, 1910.

Ward, SIR JOSEPH GEORGE (1856-1930). New Zealand statesman. Born April 26, 1856, he entered politics and became minister of railways, commerce, finance, post-master-general, minister of defence and of lands. He was prime minister, 1906-12, and 1928-30, and represented New Zealand at the Imperial Conference in London 1907, 1909, and 1911. He was a member of the imperial war cabinet, 1917-18, and one of New Zealand's representatives at the peace conference, 1919. He was created a baronet in 1911. He died July 8, 1930.

Ward, SIR LESLIE (1851-1922). British caricaturist, better known by his pseudonym Spy. Born in London, Nov. 21, 1851, he studied architecture, but later developed a gift for caricature. He became famous in connexion with the periodical *Vanity Fair*, to which he contributed during 1873-1909 a remarkable series of caricatures of his distinguished contemporaries in every walk of life. Ward wrote *Forty Years of Spy*, 1915. He was knighted in 1918, and died May 15, 1922.

Ward, MARY AUGUSTA (1851-1920). British novelist. Born June 11, 1851, at Hobart, Tasmania,

granddaughter of Thomas Arnold of Rugby, she married T. Humphry Ward in 1872 and in 1881 published her first novel, *Milly and Olly*. An admirable translation of Amiel's *Journal* followed, and in 1888 she published *Robert Elsmere*, a book which attracted much attention because of its portrayal of a religious man afflicted by doubt. Her other novels include *David Grieve*, 1892; *Marcella*, 1894; *Helbeck of Bannisdale*, 1898; *Lady Rose's Daughter*, 1903; *The Marriage of William Ashe*, 1905; *Canadian Born*, 1910; *Missing*, 1917; and *Fields of Victory*, 1919. She was keenly interested in social work, especially in the establishment of children's play centres, and founded the Passmore Edwards, later the Mary Ward, Settlement. In 1918 she published *A Writer's Recollections*. She died March 24, 1920. Consult Mrs. Humphry Ward, S. Gwynn, 1917.

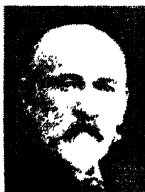
Thomas Humphry Ward was born at Hull, Nov. 9, 1845, and educated at the Merchant Taylors' School and Brasenose College, Oxford. He is chiefly known by his edition of *The English Poets*, 1881-1918, which contains selections from the English poets through the centuries. For many years he was on the staff of *The Times*. He died May 6, 1926.

Ward, THOMAS (1810-58). British adventurer and Parmese politician, known as Baron Ward. Born at York, Oct. 9, 1810, and trained as a jockey, in 1827 he entered the stables of Charles Louis, duke of Lucca, becoming his valet and confidential servant. In 1846 he was created a baron and made minister of finance, in which capacity he arranged the transfer of Lucca to Tuscany. Upon Charles Louis's accession to the duchy of Parma, Ward became his prime minister. He negotiated the abdication of his master, and installed his son as Charles III, going to Vienna as minister plenipotentiary. On the assassination of Charles III in 1854, Ward was dismissed. He died Oct. 5, 1858.

Ward, WILFRID PHILIP (1856-1916). British author. Son of W. G. Ward (v.i.), he was born Jan. 2, 1856 and educated at S. Edmund's, Ware; Ushaw College; Rome; and London university. By



Mrs. Humphry
Ward,
British novelist
Lafayette



John Q. A. Ward,
American sculptor

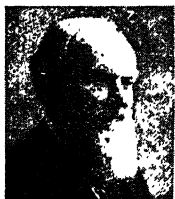


Sir Joseph Ward,
New Zealand
statesman
Bassano



Sir Leslie Ward,
British caricaturist

his writings and editorship from 1906 of *The Dublin Review*, he was known as a leading exponent of



Wilfrid P. Ward,
British author

contemporary R.C. thought. In 1896, with A. J. Balfour and Bishop Gore, he founded the Synthetic Society for discussion of religious belief. In 1913-14 he lectured in the U.S.A., and he died in London, April 7, 1916. Among his works are *W. G. Ward and the Catholic Revival*, 1893; *Aubrey de Vere*, 1904; *Ten Personal Studies*, 1908; *Life of Cardinal Newman*, 1912.

WARD, WILLIAM GEORGE (1812-82). British theologian. Born March 21, 1812, in London, he was educated at Winchester and Christ Church, Oxford. When fellow of Balliol, Ward was won over to the Tractarians. He took orders in 1840. His book, *The Ideal of a Christian Church*, 1844, brought him into disfavour with the university authorities, and in 1845, with Newman, he joined the Church of Rome. During 1851-58 he was lecturer at S. Edmund's College, Ware, and 1863-78 editor of *The Dublin Review*. "Ideal Ward" died July 6, 1882. Consult *W. G. W. and the Catholic Revival*, W. P. Ward, 1893.



William G. Ward,
British theologian

War Damage, INSURANCE AGAINST. During the Second Great War schemes were introduced in the U.K. to protect persons against loss that might be caused through the destruction or damage of their property by war activities. In respect of land and buildings, compensation was provided by the War Damage Act, 1941, and later statutes, consolidated by the War Damage Act, 1943. The term covered damage occurring (1) as the direct result of enemy action or action taken in combating the enemy (including damage by an A.A. shell fired during a false air-raid alarm); (2) through measures taken to avoid the spreading of damage, e.g. destruction of buildings to check a fire; (3) accidentally as a direct result of precautionary measures. A contribution of 10s. in the £ on the net annual value was payable in respect of all land and buildings

assessed for income tax or rating. The rate for agricultural and some other land was 6d. in the £.

The owner of land or buildings was normally liable for this contribution; but where property was let or mortgaged, the tenant or mortgagee could in certain cases be compelled to pay part. The contribution of 10s. in the £ was payable by five equal instalments on July 1 in the years 1941-45.

The owner had to report damage to the war damage commission within a specified time and make a claim; if this was allowed, he became entitled to either a cost-of-work payment or a value payment. A temporary sum was granted in respect of first-aid repairs when necessary. In a cost-of-work payment the owner received the actual amount charged at the time repairs were carried out. In a value payment he became entitled to the difference between the value of the property before and after damage plus 45 p.c. because of the great rise in building costs during and after the Second Great War. A cost-of-work payment was usually much more beneficial to the owner. A value payment was normally due when a property was a total loss; but a cost-of-work payment could be claimed in respect of any houses built after March 31, 1914, or in certain circumstances even one built before. The amount due as a value payment carried interest at 2½ p.c. per annum, less income tax, from the date of damage.

The original intention was that the state (i.e. the taxpayer) should pay half the total cost of war damage to land, the other half being provided by war damage contributions. In the event, however, the state had to bear a much larger proportion, for contributions came to only £195 million, while claims approached £1,000 million.

Goods. There were three separate schemes to cover goods, all operated by the board of trade. Under the commodity insurance scheme, traders and manufacturers insured their stock; this was usually compulsory when the total value of goods was £1,000 or more. The premium was fixed quarterly and varied from time to time. Payments for losses were made as soon as possible after they occurred. Under the business chattels scheme, persons carrying on business insured goods in their possession, or owned by them, or over which they had a mortgage; this scheme covered such items as office fittings, furniture, tools, and

movable plant. With some exceptions, insurance was compulsory where the value of insurable goods was £1,000 or more. The premium was fixed periodically. Payments for losses were not normally made until the end of the war.

The third scheme was for private chattels. Without taking out any insurance a householder was covered in respect of his private chattels up to £200 for himself plus £100 for his wife and £25 for each child under 16. To cover goods valued in excess of these amounts he could if he wished take out additional insurance. This scheme covered articles not insurable under either of the other schemes, e.g. clothes and household furniture. The premium was fixed periodically and varied; payments for losses were not normally made until after the war.

The War Risks Insurance Act, 1939, gave the board of trade power to insure and reinsure ships, and cargoes in ships or aircraft, against war risks.

Special Acts relating to landlord and tenant provided that neither should be liable for war damage to the property let. Where it was rendered unfit by war damage, the occupier could end the tenancy by notice. Another Act exempted persons from liability for goods destroyed or harmed by war damage where the goods were held by them as bailees, or on sale or return, or as innkeepers or pawnbrokers.

Warden. Defender, head, or high official. In England the guardians of the Scottish and Welsh borders were known as lords wardens of the marches. The head of the Fleet prison was called the warden. The governor of Dover Castle is the lord warden of the Cinque Ports, and the lord warden of the stannaries is the head officer of the stannaries or tin mines of Cornwall. An air raid warden was an official in the civil defence organization of the Second Great War. Warden is the title of the heads of All Souls, Keble, Merton, New, and Wadham Colleges at Oxford university. See Civil Defence; Marches.

Warden, THE. Novel by Trollope. Published in 1855, it was the first of his Barsetshire stories, and his first publication to enjoy any degree of popularity. *Barsetshire Towers* was a sequel to it.

Wardha. Dist., town, and river of the Madhya union, India, in Nagpur division. The dist. is a cotton-growing area, owing to the black soil. Wheat and pulses are

the food grains; hemp is a valuable crop. Area, 2,435 sq. m. Pop. 519,330. The town has cotton-spinning factories, and is a rly. junction 40 m. S.W. of Nagpur. Wardha College is affiliated to Nagpur university. Pop. 12,500.

The river Wardha flows generally S.E. across the dist., picks up the Penganga, marks the boundary with Hyderabad, and joins the Wainganga at a point S.W. of Markandi.

Wardmote. Court or moot formerly held in each ward of an English town. It is still held in the wards of the City of London. The court's powers include the election of an alderman for the ward. See Moot; Plough Monday.

Wardrobe. Originally a closet for keeping wearing apparel. The large piece of furniture, with doors, and occasionally fitted with drawers, now so called, was introduced under Louis XV and somewhat later in England. See Furniture.

Ward-room. In British warships, a common mess shared by the commander (unless he is in command, when he messes in his own cabin) and all other officers down to and including the rank or relative rank of lieutenant. Junior officers mess in the gun-room (*q.v.*).

Wardship. In English law, a state of pupillage, guardianship. Under this feudal system wardship was the right to the custody of the body of an infant heir of a tenant, and to the custody of the ward's property. See Socage; Tenure.

Ware. Urban dist. of Herts, England. It is on the Lea, 2 m. N.E. of Hertford, and has a rly. station. S. Edmund's is an R.C. training college; a Franciscan priory goes back to the 13th century; S. Mary's is the parish church. The manor house was built c. 1540, and there are other old residences. Literary allusions are to the Great Bed of Ware, formerly

at the Saracen's Head inn and now in the Victoria and Albert museum; and to John Gilpin's involuntary ride here from Islington. Malting, milling, engineering, coach building, and plastic manufactures are carried on. Market day, Tues. Pop. approx. 8,000.

Wareham. Market town and mun. bor. of Dorset, England. It stands between the rivers Frome and Piddle, about 2 m. from Poole Harbour and 121 m. S.W. of London by rly. The church of S. Mary contains the coffin of King Edward the Martyr and an old font. S. Martin's is partly Saxon. There are ruins of a priory and extensive remains of some British earthworks, called the walls. The four main streets form a cross. Chief



Wareham arms

industries are working clay, lime, and stone. Wareham has two yearly fairs. The Normans built a castle here, which saw fighting under Stephen, John, and in the Civil War. In the Middle Ages it was a flourishing port. It is governed by a mayor and corporation. Pop. 3,000.

Warehouse. Building where goods are stored or for the sale of wholesale goods. A bonded warehouse (*q.v.*) is one for storing imported goods, on which duty has not been paid.

Wargla OR OUARGLA. Town in the Algerian Sahara. Situated 26 m. S.E. of Ghardaia, on one of the chief routes to the Sudan and Timbuktu through In Salah, it is mentioned by Herodotus, and has traces of Roman occupation. The oasis contains thousands of date palms.

War Graves Commission. IMPERIAL. Body established by royal charter in 1917 to be responsible for the formation and maintenance of cemeteries in various parts of the world in which were interred the bodies of soldiers of British and Imperial units who lost their lives in war. The number of burial grounds containing war graves is over 15,000, of which 2,300 are in France and Belgium. The rest are maintained in 100 other countries of Europe, Asia, Africa, America, and Aus

tralia. By 1931 the total number of names on the register of the commission was 1,104,890, of whom 537,117 had been identified and buried in known graves, 517,773 recorded as missing, including 180,861 whose bodies had been found but not identified. They had been buried as "unknown." The names of all the missing appear on the many memorials erected by the commission (see War Memorials). By 1946 the number of graves had increased to 650,000.

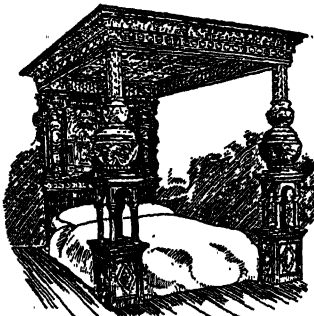
The problem of burial in foreign soil was solved by the offer of the French govt., followed by those of Belgium and other Allies of the First Great War, to present to the British authorities the land on which the cemeteries are situated. The war cemeteries all follow the same general pattern, an enclosure with grass plots and flowers, separated by paths and flanked



Wareham. North Street, one of the four main streets of this ancient market town of Dorset

with trees and shrubs, and set with rows of headstones, with a "stone of remembrance" at the E. end. The latter is a massive block of Portland stone bearing the inscription, Their name liveth for evermore (chosen by Rudyard Kipling). Also prominent is a large "cross of sacrifice." The headstones are plain and rectangular, 2 ft. 6 ins. by 1 ft. 3 ins., inscribed with the soldier's regimental no., rank, name, date of death, symbol of his faith (*e.g.* a cross), the badge of his corps, and a text or other inscription chosen and paid for by his relatives, the only charge not borne by the commission. In each cemetery building is the register of each man's parentage, age, birthplace, etc.

More than 15,000 men were employed by the commission after the First Great War in the work of exhuming and reintering the bodies and laying out the cemeteries. The bulk of the work of locating, exhuming, and reintering was completed by the end of



Ware. The Great Bed of Ware, mentioned by Shakespeare. Now at the Victoria and Albert Museum
From a drawing by C. G. Harper

1921; but as late as 1939 bodies of British soldiers were still being discovered, especially on the former Somme battlefields. The commission's h.q. are at Wooburn House, Wooburn Green, High Wycombe, and its London office at 32, Grosvenor Gardens. See N.V.

Warham, WILLIAM (c. 1450-1532). English prelate. A Hampshire boy, he was educated at



William Warham,
English prelate
After Holbein

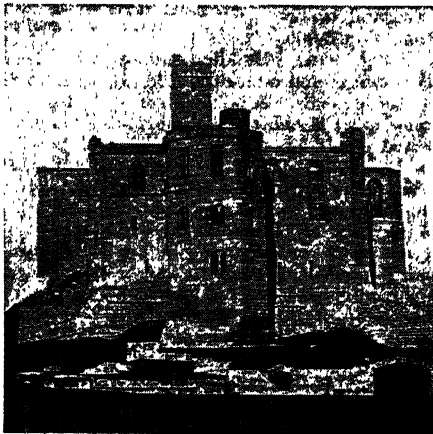
Winchester and New College, Oxford; entered the Church; and in 1494, being also a lawyer, was made master of the rolls. He was employed on various missions by Henry VII, who made him bishop of London and keeper of the great seal, 1502. Warham was translated to Canterbury in 1504, and was lord chancellor from then until 1515, when he made way for Wolsey. Warham took a subsidiary part in the divorce proceedings against Catherine of Aragon. Although he objected strongly to certain measures of Henry VIII's ecclesiastical policy, he remained archbishop and also chancellor of Oxford until his death, Aug. 22, 1532.

Warkworth. Village of Northumberland, England. Near the mouth of the Coquet, 32 m. N. of Newcastle-upon-Tyne by rly., it is famous for its church, its castle, and a hermitage of the 14th century. The origin of this last is described in Bishop Percy's ballad *The Hermit of Warkworth*. The castle, formerly belonging to the Percys, is a Norman building; it was presented to the nation by the duke of Northumberland in 1922. At the mouth of the Coquet is Amble, which exports coal and other products. Pop. 812.

War Loan. Money raised by public subscription to carry on war. The term is used particularly of loans raised to finance the Great Wars. The national debt of Great Britain originated in public subscription of £1,200,000 at 8 p.c. per annum in 1694 to finance the war conducted by William III against Louis XIV, and since then borrowing has provided much of the

money needed for wars. Liabilities of the U.K. on Aug. 1, 1914, totalled £710.5 millions. During the next five years this amount increased to £7,827 millions. More than 1,000 millions represented short-term loans secured by treasury bills and exchequer bonds; £1,300 millions was a loan from the U.S.A., Japan, and Argentina; the remaining £5,000 millions was composed principally of 4 and 5 p.c. war stock, national war bonds, and war (subsequently national) savings certificates. Interest on the national debt and the cost of its management grew from less than £20 millions in 1914 to £327 millions in 1919.

At the outbreak of war in 1939, the total debt was £8,163 millions. During the next six years there was raised by various forms of loan more than £11,000 millions, including tax reserve certificates (deposits as provision for taxes), 3 p.c. war loan, 3 p.c. defence bonds, 2½ p.c. national war bonds, 3 p.c. savings bonds, national savings certificates, treasury bills, Bank of England loans, and compulsory deposits by banks. Financial control was much more rigorous and money was borrowed at lower rates of interest than in the earlier war. Consequently, although the total debt had nearly trebled since 1919, the interest and the cost of management increased little more than a quarter.



Warkworth, Northumberland. The keep and ruins of the ancient castle, formerly a stronghold of the Percys

Warlock, PETER (1894-1930). British musician. His real name was Philip Heseltine, and he was born in London, Oct. 30, 1894. Founder and editor of *The Sackbut*, a musical journal, 1920, he did valuable work in editing Elizabethan music, of which he helped to bring about a revival. Orches-

tral arrangements of Tudor dances entitled *Capriol Suite* (1928), and of the string fantasies of Purcell.

were fine contributions. A song-writer of genius, he set many lyrics, also Yeats's poem *The Curlew*; wrote a string quartet, 1923. Of his friend Delius he wrote the same year a biography. Warlock committed suicide, Dec. 17, 1930. Consult *Memoir* of Philip Heseltine, C. Gray, 1934.

Warmbad. A settlement in South-West Africa. It is situated between Kalkfontein and Raman's Drift, on the Hom, about 30 m. N. of the Orange river, at an alt. of 2,360 ft. A missionary station was established here in 1807, the first white habitation in S.W. Africa. A German fort was built in 1893. Warmbad was occupied by S. African forces, April 6, 1915.

War Medal. (1) British medal issued in 1919 to all those who went on service overseas during the First Great War, from any part of the British Commonwealth and Empire. It was made of silver, with a design of S. George on the reverse side and the head of the sovereign on the obverse. The ribbon is: centre orange (watered) with stripes of white and black each side, and borders of royal blue. (2) British medal issued to all men and women who performed full-time service with armed forces of the British Commonwealth in the Second Great War. Authorised in 1946, the medal is of cupro-nickel and bears on the obverse the royal effigy crowned; the reverse, designed by E. Carter Preston, shows a lion standing triumphant on the body of a double-headed monster, the eagle's and dragon's heads symbolising respectively the principal occidental and oriental enemies. The medal is suspended from a ribbon having equal stripes of red, blue, white, blue, red, and a narrow red stripe through the white. Approximately 4,000,000 were issued. See *Medals* colour plate f. p. 6608.



Peter Warlock,
British musician



War Medal. British medal issued after the Second Great War

War Memorial. Means by which a community pays perpetual public tribute to the memory of those of its members who were killed in war; distinct, therefore, both from memorials to individual members of the fighting forces and from monuments commemorating great victories. They vary in form from the plain tablet with inscribed names or the stained-glass window in a church to elaborate pieces of sculpture or architecture, while others combine with their function a more utilitarian purpose, e.g. public halls, clock towers, libraries, hospitals or hospital wards, gardens, playing fields, philanthropic institutions.

War memorials were first seen in Great Britain after the Crimean War, and the British dead of most of the wars that followed were usually collectively commemorated in some form or other both nationally and locally. But it was the First Great War, with its unprecedented toll of young life, which gave every city, town, and village in the country, as well as every church and school, every business office, every commercial and industrial undertaking, a direct personal interest in its own war memorial. The Cenotaph in Whitehall was the prototype for hundreds of similar structures in the cities and larger towns of the provinces, all commemorating the "glorious dead" who had belonged to a particular geographical region. Smaller towns and villages usually preferred small shrines, crosses, or Calvaries. Though the majority followed conventional lines, some were most arresting in design and moving in sentiment.

Regimental and Local

There were also many great memorials erected in honour of the men of particular branches of the fighting services, e.g. the naval memorials at Plymouth and Portsmouth, the memorial in London to the R.A.F. (on Victoria Embankment), the Guards (Horse Guards Parade), the cavalry (Hyde Park), the artillery (Hyde Park Corner), and the Merchant Navy (Tower Hill), and the Dover Patrol memorial at Dover.

Among the other remarkable examples may be mentioned the beautiful Scottish national memorial by Edinburgh Castle, with its hall of honour; the Welsh national war memorial at Cardiff, an impressive circular colonnade; the great hall of University College, London; Birmingham's hall of memory; Loughborough's carillon; the cenotaphs at Dundee and

Scarborough, notable if only because of their magnificent hill-top sites; that at Derby which emphasises the sacrifice made by mothers; the rosemary bushes flanking the road down to Folkestone harbour; a memorial milestone at Shooter's Hill; the Indian memorial on the S. Downs near Patcham; a memorial road at Purley; the memorial arch at Corfe, Dorset, bearing the inscription: "Do'set men don't sheame their kind"; tapestries at Eton College; the cyclists' memorial at Meriden Green, Warwickshire, the reputed centre of England; the park and tower at Coventry; the old English garden at Kirkham, Lancs; various crosses cut out of the turf of chalk downs; the quaint memorial to a Yorkshire waggoners' battalion at Sledmere, Yorks, carved by a local mason, uncompromising in its depicting of German "frightfulness" and bearing verses in local dialect; avenues of trees at Colchester and at Horsforth, Yorks; the rock climbers' memorial, 3,000 acres of mountain heights in the Lake District; the G.W.R. memorial in Paddington station—a bronze figure of a soldier reading a letter; the Highlander on his granite cairn facing the Five Sisters of Kintail at Cnoc-a-Clachan, Ross and Cromarty; and the huge Freemasons' Hall in Great Queen Street, London.

The Canadian national memorial is a carillon tower at Ottawa. The Australian memorial is at Sydney (see Sydney illus.), the S. African cenotaph is at Durban, the Indian is at New Delhi (see Delhi illus., p. 2628).

France has many memorials on similar lines, notably at Verdun. One of the most striking is at Nice, carved out of the solid rock of the cliff overlooking the harbour. There are also the great memorials in France and Belgium to the thousands of British and Imperial soldiers who found unknown graves. These were set up between the two Great Wars at various points along the former western front. Of these the following are the most important; the number of men commemorated is given in brackets:

Arras (35,925)
Beaumont-Hamel (Newfoundland: 820)
Caterpillar Valley (New Zealand: 1,273)
Cambrai (7,036)
La Ferté-sous-Jouarre (3,888)
Le Touret (13,448)
Loos (20,633)
Neuve Chapelle (Indian: 4,847)

Passchendaele (34,957)
Ploegsteert (11,447)
Pozières (14,668)
Thiepval, Somme (73,367)
Villers-Bretonneux (Australian: 10,866)

Vimy (Canadian: 11,285)
Ypres, Menin Gate (54,896)

Similar memorials were erected in Italy, Gallipoli, Greece, Egypt, Palestine, Persia, Iraq, India, E. Africa. The chief Gallipoli memorial rises 100 feet against the sky on the highest ground above Cape Helles, overlooking the sea.

The Second Great War

Memorials occupied a comparatively small place in public thought after the Second Great War, and many communities were content to follow the example of the London Cenotaph which, by a simple addition to the inscription, was made to extend its commemoration to the dead of 1939–45 as to those of 1914–19. Ambitious schemes were mooted here and there, but there was no sign of that spontaneous impulse to commemorate which marked the years following the earlier war. Meanwhile the most remarkable war memorial in the world must surely be that near Hengyang, in Hunan prov., China, which consists of the skulls of 5,000 Chinese soldiers, killed in the siege of Hengyang, 1944, laid in a row across the hillside, and flanked by bare bones. See N.V., also Cenotaph; Unknown Warrior; War Graves; also illus. Neuve Chapelle; Vimy; Ypres.

Warm Front. Term applied to the boundary line, at the earth's surface, between a mass of advancing warm air and one of colder air (ooming from a different geographical source) over which the former is forced to rise along a gently sloping surface. The approach of a warm front can be detected by the appearance of the sky; high cirrus clouds are followed progressively by thicker altostratus and finally by low nimbostratus, with rain extending up to 200 m. ahead of the front. After the front has passed, the rain generally ceases or becomes very light. In the British Isles warm fronts chiefly occur in winter. See Cold Front; Weather.

Warminster. Market town of Wilts, England, 100 m. by rly. W.S.W. of London. Placed on the edge of Salisbury Plain, and on the little river Wylye, it is a market for agricultural produce, and has works for making machinery and gloves, and for weaving silk. The chief church is S. Denys, a cruciform building dating from

the 14th century. Here are a chantry dedicated to S. Lawrence, and the modern missionary college of S. Boniface. The latter houses part of the theological faculty of King's College, London. In 1937 permanent barracks and R.E.M.E. repair shops were set up at Warminster, which became the headquarters of the Imber battle training area. Pop. 6,500.

Warm Springs. Health resort of Georgia, U.S.A., in Meriwether co. It lies on a spur of Pine Mt., about 40 m. N.N.E. of Columbus, and is served by rly. Here F. D. Roosevelt was restored to health after poliomyelitis (infantile paralysis) in 1921, and hither he returned from time to time for treatment, dying here April 12, 1945. He helped in the formation of the Georgia Warm Springs foundation, a charitable corporation with h.q. at 120, Broadway, New York, N.Y., which opened here in 1940 the first sanatorium for the after-treatment of sufferers from poliomyelitis. Near by at Chipley is the Franklin D. Roosevelt state park. Warm Springs should not be confused with Hot Springs (q.v.).

War Museum, IMPERIAL. A British collection of exhibits relating to both Great Wars. Its formation was authorised in 1917, and a board of trustees appointed in 1920, when it was opened at the Crystal Palace by George V. In 1924 the tenancy there expired and the collection was removed to the western galleries in Exhibition Road, S. Kensington, where it stayed until transferred in 1936 to the present building, the old Bethlehem Hospital in Lambeth Road. On the outbreak of the Second Great War the trustees were authorised to collect further exhibits and records. The Museum was closed owing to bomb damage in 1940 and reopened in 1946.

The exhibits include relics, models, weapons, uniforms, badges, and medals, with exhibits illustrating the war effort and experiences on the home front. Models and panoramas illustrate such enterprises as the D-day landings, Pluto, Mulberry Harbour, and various warships. A reference library of some 65,000 vols. deals with all aspects of the military, social, political, and economic history of the two wars, and there are files of service journals. Galleries contain works by prominent British artists who recorded the wars in paintings, drawings, and sculpture. Another department contains all official war photographs, and official

cinematograph films are in the trustees' custody.

Warne, FREDERICK (1825-1901). British publisher, born in Westminster, Oct. 13, 1825. After being a partner in the firm of Routledge and co., he established in Bedford Street, Strand, the firm of Frederick Warne and co. In 1865, opened a branch in New York in 1881, retired in 1895, and died Nov. 7, 1901. The business was carried on by his sons. While the founder was in control it issued the Chandos Classics, the Lansdowne Poets, earlier books by Frances Burnett, Nuttall's Dictionary, and achieved success with coloured picture-books for children.

Warner, CHARLES (1846-1909). Stage name of Charles John Lickford, British actor. Born in



Charles Warner,
British actor

London, Oct. 10, 1846, and educated at Westbury College, Highgate, he was early associated with Phelps. His initial appearance on the stage was in Richelieu at Windsor Castle, 1861. He made his London debut at the Princess's Theatre, April 25, 1864, as Benvolio in Romeo and Juliet; was at Drury Lane, 1866-68; and created the part of Charles Middlewick in Our Boys, at The Vaudeville, Jan. 16, 1875. He achieved success in melodrama, especially as Coupeau, in Drink; Tom Robinson, in It's Never Too Late to Mend; and the title-part in Michael Strogoff. Warner toured Australia in 1888-90, and the U.S.A. in 1904 and 1907-09. He committed suicide in New York, Feb. 11, 1909.

Warner, HENRY BYRON (b. 1876). British actor. Son of Charles Warner (v.s.), he was born in London, Oct. 26, 1876, and educated at Bedford grammar school, first appearing on the London stage with his father in a revival of It's Never Too Late to Mend, 1898. He went to the U.S.A. in 1905 and was chosen to play the part of Christ (anonymously) in the film The King of Kings, 1927. Later he achieved



H. B. Warner,
British actor

great success in Sorrell and Son (silent film, 1928, sound version, 1934), playing minor parts when past 70, e.g. in Indian Summer, 1948.

Warner, SIR PELHAM FRANCIS (b. 1873). English cricketer. Born in Trinidad, Oct. 2, 1873, he was educated at Rugby and Oriel College, Oxford, and became a barrister. Having played cricket for his school, he was in the university eleven in 1895-96, and also appeared for Middlesex. He



"Plum" Warner,
famous captain of
M.C.C. teams and
writer on cricket

was captain of the M.C.C. team that went to Australia in 1903 and recovered the Ashes (q.v.); also of a team sent to S. Africa in 1905. In 1911 he again took a team to Australia, though illness kept him out of all the big matches. Captain of Middlesex, 1907-20, "Plum" was one of the best-known amateur cricketers of his day. In 1937 he was knighted, and in 1950 elected president of the M.C.C. He wrote on cricket in the Badminton library, and many books on cricket history, including a history of Lords, 1946; and was editor of The Cricketer.

Warner Brothers. Family of American film magnates. The eldest, Harry (b. Dec. 12, 1881), went to the U.S.A. as a child, and in 1900 opened a bicycle shop at Youngstown, Ohio, with his brother Albert (born in Baltimore). In 1903 they took into partnership the youngest brother, Jack (b. 1892), who was born in London, Ont., and was starting a career in minstrel shows. They opened at New Castle, Pa., one of the earliest theatres devoted to films. After experimenting as film distributors and producers, the brothers achieved success in 1917 with a screen version of My Four Years in Germany. Warner Brothers Pictures, Inc., became one of the most successful film organizations in the world. Jack, who became producer at the Burbank studios in Hollywood, sponsored the first biographical film, Disraeli, followed by The Story of Louis Pasteur, and The Life of Emile Zola. Harry was a pioneer in talking films with the Vitaphone co., of which he became president, with Albert as treasurer.

War Office. British department of state. At its head is the secretary of state for war, who is

ex officio president of the army council, which regulates the affairs of the whole British army. Its constitution is liable to change, but it has always hitherto contained four military and several civilian members, these last now including the parliamentary under-secretary, a financial secretary, and the permanent under-secretary, who exercises general control.

The four military members, whose relative status varies from time to time, except as regards the habitual pre-eminence of the chief of the imperial general staff, consist, in addition to the last-named, of the adjutant-general, the quartermaster-general, and the master-general of the ordnance. Among these four is distributed the work of preparing for war, maintaining the discipline of the army, feeding, quartering, and transporting the troops, each of their departments being divided into directorates, with large staffs of officers and clerical assistants.

The War office as an institution dates back to the Restoration, but its germ is to be found in the standing councils or committees of war which were in existence some forty years earlier. The lessons of the S. African War led to a complete overhauling, for which a reorganization committee was appointed. Its report recommended reconstitution of the office with the single aim of preparing the military forces of the crown for war. It also proposed the creation of an army council which was set up in 1904.

The headquarters of the War office, at one time at the Horse Guards (*q.v.*), and later in Pall Mall, on a site now covered by the Royal Automobile Club, are housed in an imposing structure between Whitehall Place and Horse Guards Avenue, designed by William Young and built in 1899-1906, at a cost of over £1,000,000. *See* Whitehall.

Warp. In geology, mud or clay of alluvial or glacial origin deposited in estuaries or lakes. Much was laid down during the retreat of the glaciers of the Ice Age, when muddy streams entered the sea in extensive estuaries. Tidal currents checked the outflow of sediment and may have carried it inland again to areas of still water where it was deposited, later forming valuable arable land. Mud and clay deposits of the old glacial lakes of Yorkshire are also referred to as warp. Some of these show laminations

due to seasonal deposition, i.e. varved clays. Artificial warping has produced much fertile land. *See* Ice Age; Varves.

Warp and Weft. Terms used in weaving. The warp threads run lengthwise through the piece of cloth, while the weft threads are transverse. *See* Weaving.

Warrantice. Term used in Scots law. It is a guarantee given by one who grants property to another that this shall not be taken from him by someone who has a better title to it.

Warrant. Name given to a document that authorises or assures. In English law it is a written order, given by a person in authority, to do some act. Warrants are issued for the arrest of alleged criminals and for searching premises. A distress (*q.v.*) warrant is one authorising the sheriff's officer to seize goods for arrears of rent. A general warrant was one directed against offenders generally, no name being mentioned. This practice was declared illegal after the arrest of Wilkes on one. Ordinary warrants are signed by magistrates, sheriffs, or other legal officials. Other warrants are issued by the sovereign and by govt. depts. The term is also used for documents authorising the payments of dividends or the delivery of goods out of bond. The term warranty is used for a guarantee that goods sold are what they are alleged to be.

Royal warrants, renewable every 10 years, are appointed to individual tradesmen and craftsmen (not to a firm as such) who supply the sovereign and certain other royal personages with goods. Such a warrant expires with the death of the grantor or the death or retirement of the grantee, or if the firm of which the individual is representative is wound up or materially changes character; and it may also be forfeited for other reasons.

Warrant Officer. Rank in the British armed forces. Intermediate between commissioned and non-commissioned officers, the warrant officer derives his title from the warrant signed by the secretary of state for war or air or by the first lord of the Admiralty.

Every branch of the Royal Navy has its quota of warrant officers, but until 1918 the rank was limited to boatswains, gunners, and shipwrights, all trades dating back to the beginning of the service. Warrant officers are promoted from the lower deck

and may go on to commissioned rank. On the sleeve is one thin gold stripe, backed by a cloth stripe in the colour appropriate to the branch of the service. Naval warrant officers are addressed as Mr. by superiors, as Sir by lower ranks, and entitled to a salute from the lower deck. (*See* Royal Navy colour plate.)

Army warrant officers are of two classes. Class 1 includes regimental sergeant-majors and the senior warrant officers of a regimental unit. Since 1936, a W.O. class 1 has been entitled to command a platoon. The R.A.S.C., R.A.O.C., R.E.M.E., R.A.M.C., and Royal Signals have a stated number. Regimental bandmasters are sometimes in this class, but are more usually granted honorary commissions. The W.O. class 1 wears the royal arms on the sleeve. He is addressed as Mr. by commissioned officers, as Sir by lower ranks, but is not entitled to a salute. Warrant officers class 2 are company sergeant-majors, whose distinguishing badge is a crown worn on the sleeve. They are not addressed as Sir and are always referred to by rank.

In the R.A.F. the W.O.1 is the senior warrant officer of a squadron or station, but the actual aircrew personnel of a flying squadron may include more than one such. A station warrant officer has authority over all W.O.1s on the station. He is addressed as Sir or Mr. Insignia of rank are the royal arms worn on the sleeve; dress includes officer's uniform and cap badge on forage cap or beret, but a special badge when wearing a peaked cap. A W.O. class 2 has the same sleeve insignia but other ranks' uniform and cap badge. R.A.F. and army warrant officers dine in the sergeants' mess, but those in the navy have their own mess.

Warre, EDMOND (1837-1920). British schoolmaster. Born in London, Feb. 12, 1837, he had a distinguished career at Eton and Balliol College, Oxford, becoming fellow of All Souls in 1859. He also rowed in the Oxford eight, 1857-59, and in later years wrote much on rowing. Returning to Eton as assistant master in 1860, he was ordained and made headmaster in 1884; retired in 1905; and in 1909 was elected provost. He was considered one of Eton's most notable headmasters, and a memoir by C. R. S. Fletcher appeared in 1922. He died Jan. 22, 1920.

Warren (Old French *warir*, to keep). Breeding place for rabbits. In artificial enclosures one acre, covered with good grass and planted frequently with furze and juniper, is sufficient to support about twenty rabbits. The word is also used for ground enclosed for the preservation and breeding of game, or for a fish preserve in a river. In legal terminology, free warren, or right of warren, is a franchise, obtained by prescription or grant of the crown, for the right of property in beasts and fowls of warren. These include rabbits, hares, pheasants, and partridges, and sometimes also woodcock, quail, and waterfowl, but not grouse.

Warren. City of Ohio, U.S.A., the co. seat of Trumbull co. Situated on the Mahoning river, 50 m. S.E. of Cleveland, and served by the Baltimore and Ohio and other rlys., it is an industrial centre, with manufactures of steel goods. The neighbourhood produces coal and iron. Warren was settled in 1799, and became a city in 1834. Pop. 42,837.

Warren. Bor. of Pennsylvania, U.S.A., the co. seat of Warren co. It is 65 m. E.S.E. of Erie, on the Allegheny river, and is a junction on the New York Central and Pennsylvania rlys. Warren was founded in 1795, and incorporated in 1832. There are oil refineries, metal works, and furniture factories. Pop. 14,891.

Warren, SIR CHARLES (1840-1927). British soldier. Born Feb. 7, 1840, and educated at Cheltenham, Sandhurst, and Woolwich, he entered the R.E. in 1857, and was engaged in survey duties, especially in Palestine. He commanded troops against the Bechuanas, 1878, was commander-in-



Sir Charles Warren,
British soldier
Russell

chief and administrator of Griqualand West and led an expedition against the Bechuanas, 1884-85, for which he was knighted. Having commanded in the Suakin campaign, he was commissioner of metropolitan police, 1886-88, and, commander-in-chief, Straits Settlements, 1889-94. In the S. African War, when in command of the 5th division, he incurred much criticism through his operations at Spion Kop. *Consult* Life, W. Williams, 1941.

Warren, SIR JOHN BORLASE (1753-1822). British sailor. Born Sept. 2, 1753, at Stapleford, Notts,



Sir J. B. Warren,
British sailor

he came into a baronetcy in 1775, and in 1777 entered the navy. Commanding a frigate squadron in 1793 he harried French shipping in the Channel, capturing many privateers and distinguishing himself at Quiberon Bay (*q.v.*). For intercepting and destroying a French squadron which was attempting a landing in Ireland, 1798, he was promoted rear-admiral next year. He was commander-in-chief of the N. American station, 1813-14, and died Feb. 27, 1822.

Warren, SAMUEL (1807-77). British novelist and lawyer. Born near Wrexham, May 23, 1807, he was educated at Edinburgh for the medical profession, but preferring the law, entered the Inner Temple in 1828 and practised as a special pleader before being called to the bar in 1837. Made recorder of Hull, 1852, and M.P. for Midhurst, 1856-59, he was appointed a master in lunacy, 1859, and died July 29, 1877. Warren's fame rests upon his novel *Ten Thousand a Year*, with its crude humour and caricatures of the great; this first appeared 1839-41 in Blackwood's Magazine. Popularity was also achieved by his melodramatic *Passages from the Diary of a Late Physician*, 1830-37.

Warren, SIR (THOMAS) HERBERT (1853-1930). British scholar. Born at Bristol, Oct. 21, 1853, he was educated at Clifton and Balliol College, Oxford, where he graduated in 1876. Fellow of Magdalen, 1877-85, he was elected president in 1885, was vice-chancellor of Oxford, 1906-10, and professor of poetry, 1911-16. He was made K.C.V.O. in 1914, and retained the



Sir Herbert Warren,
British scholar

presidency of the college until 1928. He died June 9, 1930. Among Sir Herbert's own poems may be mentioned *By Severn Sea*, 1897, and *The Death of Virgil*, 1907. His other works include *Oxford and Poetry*, 1911; *War and Poetry*, 1915.

Warrenpoint. Seaport and urb. dist. of Down, N. Ireland. At the head of Carlingford Lough, 6 m. S.E. of Newry, it is a rly. terminus and has steamer service to Liverpool. Pop. 1,900.

Warri or **Wari.** River port of Nigeria. It stands 80 m. S.S.E. of Sapele by creek, on the Forcados branch of the Niger estuary, and can be reached by vessels with a draught of 13 ft. The name is also that of a prov. of S. Nigeria, on the Bight of Benin.

Warrington. Co. and mun. bor. and market town of Lancs, England. Situated on the Mersey, between Liverpool and Manchester, it is 182 m. N.W. of London and has rly. and canal communication with all parts of industrial Lancs and Cheshire. The parish church of S. Elphin stands on the site of a 12th century building, and has a tower and spire 281 ft. high. The church was restored in 1860. Other buildings are the grammar school, founded in 1526, and the bluecoat school, 1665. There are also a town hall, free library (the first



Warrington arms



Warrington, Lancashire. Parish church of S. Elphin, built on the site of a 12th century building. The spire is 281 ft. high

in Great Britain to be supported by the rates), museum, technical institute, and the Sankey Hall for concerts, etc.

Warrington makes many different types of industrial products, notably wire, pins, cotton ware, glass, and soap. Claiming to be built on the site of Veratimum, the Roman ford over the Mersey, Warrington was early an important place, and in the Civil War was the headquarters from which Lord Derby attacked the parliamentary stronghold of Manchester. The fairs and markets of Warrington date from the 13th century, but it did not become a chartered town until 1847. In 1900 it became a county bor. It elects one M.P. Market days, Wed., Fri., and Sat. Pop. est. 78,550.

Warriston, ARCHIBALD JOHNSTON, LORD (1611-63). Scottish statesman. Born in Edinburgh, March 28, 1611, he went to Glasgow university, and came into prominence in 1638, when he assisted Alexander Henderson (q.v.) to frame the Solemn League and Covenant, and was chosen clerk of the Glasgow assembly. A commissioner at the peace of Berwick, 1639, and

at the treaty of Ripon, 1640, he became a lord of session in 1641. Warriston was a passionate oppon-



Lord Warriston,
Scottish statesman
After G. Jameson

ent of Montrose, disagreed with the negotiations between the Scottish parliament and Charles I, 1648, and allied himself to the Puritan party. A zealot, "full of fire, of heavy energy and gloom," he protested against the subordination of kirk to state. Summoned to Cromwell's house of lords in 1658, he also acted as chairman of the committee of public safety. After the Restoration he was tried at Edinburgh and hanged July 23, 1663.

Warrnambool. City and seaport of Victoria, Australia. It is on the S. coast, 166 m. W.S.W. of Melbourne, with which it has rly. and steamer communication. Its good harbour and the agricultural land behind make it the chief western entrepôt of trade. It has freestone quarries. Population 9,997.

and ends at the square of the Lublin Union (Plac Unji Lubelskiej), where a monument to fallen airmen was erected. The old town, in the N.E. of Warsaw, with old burghers' houses and picturesque market square, was completely destroyed in 1944.

After 1920 the Russian Orthodox church in Saxon Sq. (Plac Saski), a pompous building in Byzantine style, was demolished. The large Saxon Sq. itself, in which a cenotaph with undying flame stood, was renamed Pilsudski Sq. The stucco façades which concealed the contour of houses of the time of Stanislas II were removed. The rough cobbled roadways, laid during Russian administration, were torn up and resurfaced. The streets were replanned and a more direct approach to the Vistula opened. Praga, roughly a third of Warsaw's total area, and Wola, another suburb, became centres of industry and workers' quarters; the former industrial dists. of Czerniaków and Mokotów developed into residential areas. Two new garden suburbs, Żolibórz, behind the old citadel, and Ochota, to the W. of the city, both built on almost waste land and governed by cooperative management, became residential dists. for professional men, artists, actors, officers, etc. (Workers' flats were put up in Żolibórz after the war.) Trees were planted along the streets. In the Łazienki park a monument was erected to Chopin; in the adjoining botanical gardens stood the astronomical observatory. A new park, named after the novelist Stefan Żeromski, was made on the site of the former Russian fortifications.

During 1919-39 education in Warsaw was greatly improved. In 1939 18,000 students were attending schools of university status, 8,000 of them, nearly half women, at the university itself. In 1937 Warsaw had 143 nursery schools, 380 primary schools, 100 secondary schools, 193 trade schools. A national library founded in 1927 contained half a million vols., 20,000 old MSS., 80,000 engravings. The university library had 800,000 vols. and 100,000 engravings. From the times of the partitions, there remained the formerly private libraries of the Zamoyiski foundation. The diet (*sejm*) and the senate had a good collection of literature on the history of parliament. Most of these books were destroyed during the war.

The diet building itself was reconstructed in record time, with

WARSAW: CAPITAL OF POLAND

Simon Wolf, LL.D. (Vienna), and Others

The story of the tragic capital of a tragic country is here told. Warsaw, several times in its history badly damaged, was thought by the Germans to have been effectually destroyed during the Second Great War, but the Poles began immediately to construct anew the city by the Vistula

After Poland became an independent country once more in 1919, her capital Warsaw developed rapidly.



Warsaw arms

By absorption of neighbouring dists., and an influx of inhabitants from the provs., its area grew to nearly 50 sq. m., its pop. to 1,289,000 (1939), 30 p.c. Jewish, 66 p.c. R.C. Warsaw proper lies on the left bank of the Vistula, 90 ft. above and sloping steeply down to the river, along which were built new, low-lying quarters. On the right bank is the large suburb of Praga, linked with the left bank until 1944 by three road and two rly. bridges, all destroyed by the Germans during the Second Great War. Of Praga that war left substantial parts; of Warsaw perhaps 10 p.c. One of the first things to be rebuilt, in nine months, was the Poniatowski bridge; and between Jan., 1945, and Aug., 1947, with the help of

U.N.R.R.A. bulldozers and mixing machines, 20 p.c. of destroyed Warsaw was rebuilt.

The main thoroughfare, running N. to S., is a wide street called Krakowskie Przedmieście (Cracow suburb); its continuation is Nowy Świat (new world) street and the Aleje Ujazdowskie avenue, which adjoined the parks where the foreign embassies and legations lay, many housed in beautiful palaces. At the beginning of this road stood the Zamek (royal castle), seat of the president (reduced to a heap of rubble in 1944); at its far end was the Belvedere palace, for many years the home of Pilsudski, and converted into the Pilsudski museum after his death. The second main thoroughfare, running more or less parallel with the first, is Marszałkowska street, still Warsaw's Bond St. two years after the war when one-storey shops had sprung up on the sites of those destroyed. It begins at the Ogród Saski (Saxon gardens), passes the central rly. station, Warsaw's busiest traffic spot,

very little aid from machinery; and by the summer of 1947 many schools and govt., trade union, and newspaper offices had been rebuilt. Plans for further restoration included making a strip of gardens and sports grounds $\frac{1}{2}$ to $2\frac{1}{2}$ m. wide along the Vistula, in place of the vanished houses that formerly lined it; widening of the Marszałkowska from 30 to 120 yds.; concentration of light industry in the W., of heavy industry (wiped out in the war) in the N.; construction on the rubble-heap that was the former Jewish quarter of a garden city for workers; and reservation of space for later construction of theatres, cinemas, sports grounds.

Character of the People

The Warsaw that ceased to exist in 1939 has been called the Paris of the N. Vitality, drive, and temperament are characteristic of the people, who are also progressive and of a lively humour which found expression in e.g. cabaret songs and satires criticising the country's rulers. In times of adversity, Warsaw's gaiety and lightheartedness give place to a patriotic spirit ready for boundless sacrifice. The people of Warsaw admire music, song, and the fine arts. They also enjoy good food, and had numerous excellent restaurants. Coffee-houses and coffee-house life have always flourished and were among the first institutions to be revived in 1945. Pastries served in these *cukiernias* were world famous, the chocolates made in Warsaw were among the best in the world. There were many night clubs and other places of entertainment. Driving in a horse cab along the avenues was a popular pastime, left over from the pre-motor era. Parks, old buildings, wide streets, luxury shops, and pleasant climate (hot summers and dry, cold winters), the river, and the agreeable, though flat, countryside made Warsaw one of the most lovable capitals of Europe.

The majority of the Jews lived in their own congested dist. called Nalewki after its main street. It embraced wealth and poverty, workshops in cellars and up-to-date flats, theatres and publishing houses, factories and coffee-houses. A town in itself, the Jewish quarter was nevertheless an integral part of the capital, and one of the most interesting communities in Europe. Not until the Nazi occupation was a wall built round it, turning it into a ghetto.

HISTORY. There is no satisfactory explanation of the name Warsaw (Pol. Warszawa); neither

is it known why her coat of arms bears a siren armed with a sword and shield; but her motto *Contemnit procellas* (she defies the tempests) does correspond to facts: the city has survived many storms. The first reference to Warsaw occurs in a document of 1251. At that time it consisted of a church, a castle, and a small settlement whose inhabitants made their living by fishing in the Vistula. These fishermen were Masurians (people of the duchy of Masovia, incorporated into Poland only in 1526). In 1339 two papal delegates reached Warsaw from Rome to conduct the trial of the Teutonic knights of the Cross. Conrad II, duke of Masovia, left the fishing village intact, but on the adjoining higher ground built a town surrounded by fortifications which was completed in 1379.

In the 15th cent., Warsaw grew rapidly, the new suburbs being given in 1414 the status of a town as New Warsaw; henceforth there were two towns with separate municipal authorities. Soon this double city developed into a lively centre of commerce, and kings of the Jagellon dynasty favoured it more and more. When that royal house died out, and the Polish throne became elective, the election meetings took place in the suburb of Wola. The Swedish king Sigismund Waza made Warsaw the capital, it being nearer to Sweden than Cracow, the former capital. In the middle of the 17th cent., during the wars with Sweden, the Swedish garrison in the city defended it, contrary to the will of the Polish burghers, against the besieging Polish forces; the resulting destruction caused a change in the layout of the city. In 1702, during another Polish-Swedish war, Warsaw was twice captured by the Swedish king Charles XII. Fire ravaged much of it; and the plague raged for two years, killing 30,000. The last Polish king, Stanislas II, himself drew plans for new parts of Warsaw, directed the rebuilding of the royal castle after a fire in 1769, and designed the beautiful Łazienki palace, with its lovely park. During the *Kościuszko* rising against the Russians in 1794 a Warsaw cobbler, Jan Kiliński, led the people of the old town into battle, and defeated the Russian garrison. By the autumn of the same year the tsarist army of Gen. Suvorov had captured Praga and, having massacred that suburb's inhabitants, crossed the river to the capital.

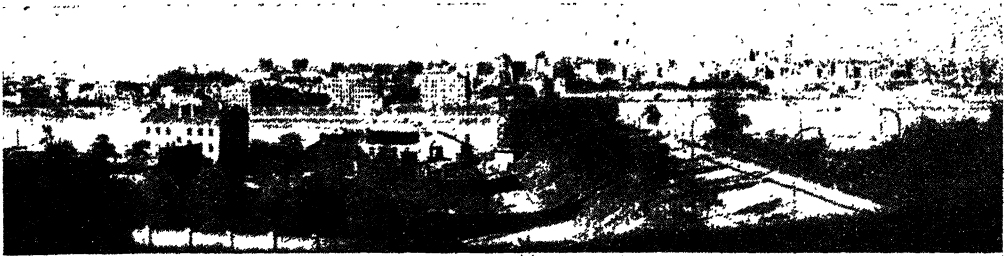
As a result of the third partition 1795, Warsaw was incorporated into Prussia, becoming simply the seat of a prov. govt.; the pop. fell from 200,000 to 60,000. In 1807 Warsaw became capital of the small, independent, short-lived duchy of Warsaw, created by Napoleon. The congress of Vienna, 1814-15, established "Congress Poland," with Warsaw as capital, where the Russian emperor was crowned as king of Poland. The first great rising against Russian rule began in Warsaw in 1830; it was the head and heart of the second rising against the Russians in 1863, also suppressed; and there was street fighting here in 1905 when the Russians lost the war against Japan.

Capital of New Poland

During the First Great War, Warsaw was in 1915 occupied by the Germans, who attempted to win the Poles to their side by allowing them a semblance of independence. When Poland was reborn in 1919, Warsaw became her capital. In 1920, when the Polish army was thrown back from Kiev, the Red army, after a lightning advance, appeared at the gates of Warsaw. The Poles won the ensuing battle, and saved the capital.

SECOND GREAT WAR. From Sept. 1, 1939, the day of the German attack on Poland, Warsaw was subjected to bombing from the air. Land attack on the city began on Sept. 7; the ring closed about it on the 14th. On Sept. 16 Warsaw rejected a German demand for capitulation; on the 24th the Germans threatened to use gas; during a heavy artillery bombardment on the 25th and 26th thousands of citizens were killed and large parts of the city laid in ruins. On the 27th an armistice was signed, and on Oct. 1 the Germans entered Warsaw. Hitler drove in triumph through the city on Oct. 14, over a route carefully selected for him so that he should not see the extent of the damage. Ludwig Fischer was appointed governor of Warsaw (after a trial in that city Nov. 28, 1946-March 3, 1947, he was hanged in Mokotów prison there, March 7, 1947); and the city became for five years the scene of searches, street round-ups, evictions, arrests, abduction of hostages, executions. There was always hunger and, in winter, cold. The best shops, parks, trains, tram cars were reserved for Germans.

Many thousands of men of military age escaped to join the Polish forces in the W.; tens of thousands fled E. to Russia; while refugees



Warsaw, Poland. The city as seen by the advancing Russian armies during the Second Great War from the eastern suburb of Praga, across the Vistula. Right, Post-war reconstruction in the capital

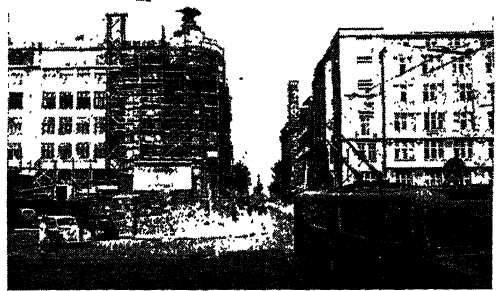
from W. Poland, annexed by the Germans, streamed into Warsaw. The Germans closed all higher and secondary schools; many of the dispossessed, including professional men, took to trading. From the early days of the occupation, clandestine liberation groups were formed; an underground press came into existence; sabotage was carried on.

In the walled-off ghetto, into which all the Jews of the city were herded in 1940, conditions were peculiarly hideous. Down the centre of the streets were passageways for "Aryans" only, should any wish to enter the Jewish area. Jews could cross the street only by bridges built across these passageways. Entrance and exit to the ghetto were by pass alone. Food inside the ghetto was so scarce that the death rate in the winter of 1941-42 rose to 13 p.c. (Warsaw figure in 1938 was 1.07 p.c.). Between July 22 and Sept. 1, 1942, a quarter of a million Jews were deported, of whom only 4,000 could be traced as living at the end of the year. Destruction of the Jews of Warsaw was completed between April 19 and 28, 1943. Using tanks, bombers, and artillery, the German army and S.S. troops attacked men, women, and children whose only arms were a few machine-guns and rifles smuggled in by the Polish underground movement; 26,000 were massacred, the remaining 14,000 were deported. About 300 Germans were killed, 1,000 wounded, in this unequal battle. For leadership in this action the exiled Polish govt. awarded posthumously to Michael Klepfisz the silver medal of the order *Virtute Militari*.

In the last days of July, 1944, Rokossovsky was approaching Warsaw. The Germans had made the Vistula into a defence line, and to defend Praga, a bastion bridge-head, they had concentrated a force too strong to be overcome by the advanced Russian troops, who

had to fight harder and harder as they approached Praga. Nevertheless, the Red army had had so many recent successes that Gen. Tadeusz Komorowski (otherwise Gen. Bor), c-in-c. of the Polish home army in Warsaw, and authorised by the Polish exiled govt. to use his own judgement as to the timing of a rising in the city, assumed Praga would fall to the Russians with little difficulty, and probably also Warsaw itself, and he decided to strike at 5 p.m. on Aug. 1. His forces achieved great initial success. The Germans, however, made counter-attacks of such violence against Rokossovsky's troops that they did not take Praga until Sept. 14.

The partisans in Praga were suppressed within a day; in Warsaw itself they were driven by the Germans from the old town, destroyed house by house, and then from the centre of the new town. Some outside help came to them in supplies, food, and weapons dropped by the R.A.F., and, after Sept. 14, by the Red air force; while on Sept. 16 a large force of U.S. bombers dropped supplies over Warsaw and flew on to land in Russia. But by the time the Russians had taken Praga the Germans had destroyed the bridges. The Russians failed in attempts to cross the heavily defended river, here 450 yds. wide, in the floats, rafts, and rubber boats by which they had contrived surprise crossings of other rivers, until Sept. 23 when Gen. Bor reported that some had succeeded in landing. Russian guns and aircraft, under partisan wireless guidance from inside Warsaw, bombarded the German positions. But the Russians did not get sufficient troops across to save the partisans who



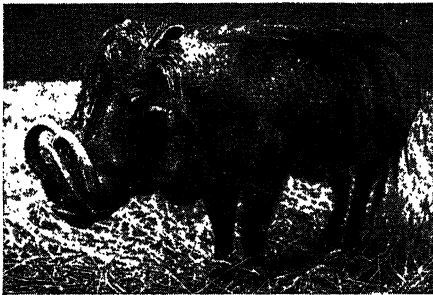
held on until Oct. 3. When they surrendered, only 15,000 out of 80,000 originally engaged laid down their arms; and the capital had been almost totally destroyed. After the surrender the Germans drove the inhabitants to a concentration camp at Pręzków, whence many were sent to forced labour in Germany. The exiled Polish govt. believed the Russian failure to relieve the Warsaw partisans was deliberate; one reason for this belief being the Russian refusal of landing facilities for R.A.F. aircraft. There are, however, reasonable grounds for doubting it.

Not until Jan. 17, 1945, did the Red army at last reach Warsaw and clear the Germans from the rubble heaps that had been a great city. Next day, the provisional govt. set up at Lublin on Dec. 31, 1944, moved to Warsaw and set itself to rebuild Poland and the capital from the city's cellars.

Warship. Any vessel built for purposes of fighting. See Battleship; Corvette; Cruiser; Destroyer; Dreadnought; Frigate; Navy; Royal Navy; Sea Power; Submarine, etc.

Warspite. Former British battleship. Launched at Devonport in 1913, she was of the Queen Elizabeth class and displaced 27,500 tons on a length of 600 ft. and a beam of 104 ft. She had a main armament of eight 15-in. guns, and secondary batteries of eight 6-in., eight 4-in., and 20 A.A. guns. Serving with the Grand Fleet, she was damaged at Jutland. In 1937 she was reconstructed at a cost of £2,500,000, her displace-

ment being increased to 30,600 tons and her engines renewed to give a speed of 24 knots. Accommodation was also provided for four aircraft. In the Second Great War the Warspite took part in the attack on Narvik; was at Cape Matapan as flagship; and helped to cover the Allied landings at Salerno, where she was severely damaged by German glider bombs. She provided covering fire for the Royal Marine assault on Walcheren. In 1947 the Warspite was sold for scrapping, but in a gale was driven ashore at Prussia Cove, Cornwall, and became a total loss.



Wart Hog. Boar of the Ethiopian species *Phacochoerus aethiopicus*

Wart. An overgrowth of the horny layer of the skin, usually on the hands or fingers. Probably due to a virus, a wart may be destroyed by frequent application of caustics such as glacial acetic acid or solid carbon dioxide. Many types of wart come under the control of the nervous system, and can be "charmed" into departure by folk-medicine. Much fascinating investigation is being done on these mysterious growths.

Warta (Ger. Warthe). River mostly in Poland but in its lower course in Germany. It rises on the N. side of the Carpathians, N.W. of Cracow, and flows generally N., then W. It is navigable from Konin, and Poznan is the principal town on its banks. After some 450 m. the river reaches Küstrin, N. Germany, to join the Oder, of which it is the most important tributary.

Wartburg. Peak of Thuringia, Germany. It is near Eisenach, at the N.W. end of the Thuringian Forest, and is chiefly known because of the castle built here by a ruler of Thuringia about 1100. It became a resort of the Minnesingers, and here in 1207 took place the competition between them mentioned in Wagner's *Tannhäuser*. The castle passed later to the elector of Saxony, and hither Luther was carried by order

of the elector Frederick III in 1521, when his life was in danger. He remained there for ten months. The building was restored in the 18th century and until 1918 was a residence of the dukes of Saxe-Weimar. There are relics of Luther. See Eisenach; Luther.

Wart Disease (*Synchytrium endobioticum*). Tumorous fungus-like growth which affects potatoes upon both stem and tuber. It first obtains access to the potato through one or more of the eyes, and continues to expand in the form of a globular protoplasmic mass. The cells die, leaving only the cell wall,

after the manner of coral formations, but the process of growth or building up continues indefinitely. There is no remedy for this fungoid disease, and all infected tubers should be dug up and burnt. All occupiers of land upon which the disease occurs must at once report its appearance to the ministry of Agriculture and Fisheries.

Wart Hog (*Phacochoerus*). Genus of two species of African swine (Suidae). Generally resembling the wild boar, they are distinguished by the large head, four huge tusks, and three flexible pads on each side of the long face. Except in the breeding season the old boars are solitary, but two or three sows with their litters will run together. The cheek pads or "warts" are believed to serve as shields for the rather prominent eyes during contests of the boars. Both species (*P. aethiopicus* and *P. africanus*) are much alike, and have a long mane of coarse, bristly hair on the neck and back.

Warton, JOSEPH (1722-1800).

British poet and critic. Born at Dunsfold, Surrey, and educated at Winchester (with Collins) and Oriel College, Oxford, he was ordained and held several charges before returning to Winchester in 1755 as second master. During 1766-93 he was headmaster there. A familiar figure in the London literary circle of which Johnson was the centre, Warton is known for his *Odes*, 1746. These are artificial in style, but The

Enthusiast or The Lover of Nature, 1744, in its genuine feeling for scenery, marks a reaction from the prevalent artificial school and foreshadows the romantic revival. The classical school is criticised as lacking imagination in Warton's sensational Essay on the Genius and Writings of Pope, 2 vols., 1756-1782. He died Feb. 12, 1800.

Warton, THOMAS (1728-90). A British poet and critic. Born at Basingstoke, Jan. 9, 1728, brother



Thomas Warton, British poet After Reynolds

of Joseph Warton, he was educated at Trinity College, Oxford, of which he became tutor and fellow, devoting himself to literature and becoming professor of poetry at Oxford in 1757. In 1785 he was made Camden professor of history, and the same year poet laureate. He died May 21, 1790. He wrote much verse in a light vein, but his fame rests on the scholarly *Observations on the Faerie Queene*, 1754, and on the uncompleted *History of English Poetry*, 1774-81, a landmark in English literature inasmuch as it focused attention on the imaginative literature of the past, provoked reaction from 18th century classicism, and was thus a factor in the romantic revival. Warton also edited Theocritus, and some of the shorter poems of Milton.

Warwick. Mun. bor. and co. town of Warwickshire, England. Situated on the N. bank of the Avon, it is 21 m. S.E. of Birmingham and is served by rly. Probably an ancient British settlement, the town became important with the erection in 915 of the castle, founded by Ethelfleda, daughter of Alfred the Great. The principal church is S. Mary's, largely rebuilt after a fire in 1694. Parts of the older building remain in the chancel and the Beauchamp chapel, which contains tombs of the earls of Warwick. Two old gates still remain, and near Westgate is the fine 14th century, half-timbered Lord Leycester's Hospital, an almshouse for 12 poor brethren.

Warwick Castle is a good example of 14th century fortification. It was largely strengthened in the early 17th century and was held against the Royalists at the start of the Civil War. In 1871 much of the interior was destroyed by fire. Other buildings of interest are the grammar school, said to have



Joseph Warton, British poet

been founded by Edward the Confessor and now called Warwick school; the shire hall; and the public library.

Gelatine and isinglass are made, and there are light engineering, plastic moulding, and carpet industries. Warwick and Leamington is the name of a co. constituency. Market day, Sat. Pop. est. 14,470. See Almshouses illus. p. 327.

Warwick, EARL OF. English title held by various families since the 12th century—at present by that of Greville. The 1st earl was the Norman, Henry de Newburgh (d. 1123). On the death in 1242 of Thomas, 6th earl, the title passed through two female descents to William de Beauchamp, 9th earl. Thomas (1313–69), 11th earl, was at Crecy and Poitiers, and was one of the original garter knights. On the death of Henry, 14th earl, 1445, the title was granted to his daughter Anne. At her decease four years later it passed to Henry's sister Anne, and so to her husband, the famous King-maker (v.i.). When Anne died, 1493, the title passed to her grandson, Edward Plantagenet, who was deprived of his title and executed in 1499 for alleged complicity in Warbeck's rebellion.

The family of Dudley held the title, 1547–90, one who did so being the duke of Northumberland of Edward VI's reign. In 1618 it was revived for Robert, 3rd Baron Rich, and remained in his family till the death of the 29th earl in 1759. Immediately the earldom was granted to Francis Greville, Lord Brooke, of Warwick Castle. From him was descended Francis (1853–1924), 5th earl of the new creation. He married Frances Evelyn, daughter of C. H. Maynard, who became known as a Socialist author and philanthropist. Charles, 7th earl, was born March 4, 1911, and succeeded his father in 1928. The eldest son is called Lord Brooke.

Warwick, RICHARD NEVILLE, EARL OF (1428–71). English soldier and statesman, called the King-maker. He was born Nov. 22, 1428, son of Richard Neville, earl of Salisbury, whose sister married Richard, duke of York. Young Richard became earl of Warwick by his marriage with the heiress to the earldom. When the Wars of the Roses broke out in 1455 he followed his uncle York, distinguishing himself at St. Albans. He was made governor of Calais, and in 1457 lord high admiral, winning a sea fight against the Spaniards. Having been nearly

killed in a brawl, he escaped to Calais, but came home to join in the English wars again in 1459. At the battle of Northampton, July 10, 1460, he captured Henry



VI and issued his famous order, summing up the whole struggle, to "spare the commons and slay the lords."

When the Lancastrians killed both York and Salisbury after their victory at Wakefield in Dec., Warwick gave uncompromising support to the claim of his cousin, Edward of York, to the throne. The pair crushed the Lancastrians at Towton, March 29, 1461, thereby securing Edward IV on the throne. The king left the government to Warwick, who was ostensibly permitted to pursue his own policy of an alliance with France. But Edward behind his back paralysed that policy, first by a secret marriage in 1464 with Elizabeth Woodville, whose relations, enemies to Warwick, were promoted; and then in 1467 by negotiating an alliance with Burgundy. The result was a breach which widened until in 1469 Warwick rose in arms, captured the king, and in effect assumed the supreme authority. Next year, during a revolt in East Anglia, Edward raised an army and suddenly turned the tables. Now Warwick had to flee to France, where he reconciled himself to the Lancastrians and, collecting a force, landed in Devon. Edward fled and Warwick restored the imprisoned Henry VI to the throne. But in March, 1471, Edward again landed in Yorkshire, and defeated and killed Warwick at the battle of Barnet, April 14.

If Warwick was the typical feudal baron with whom his own



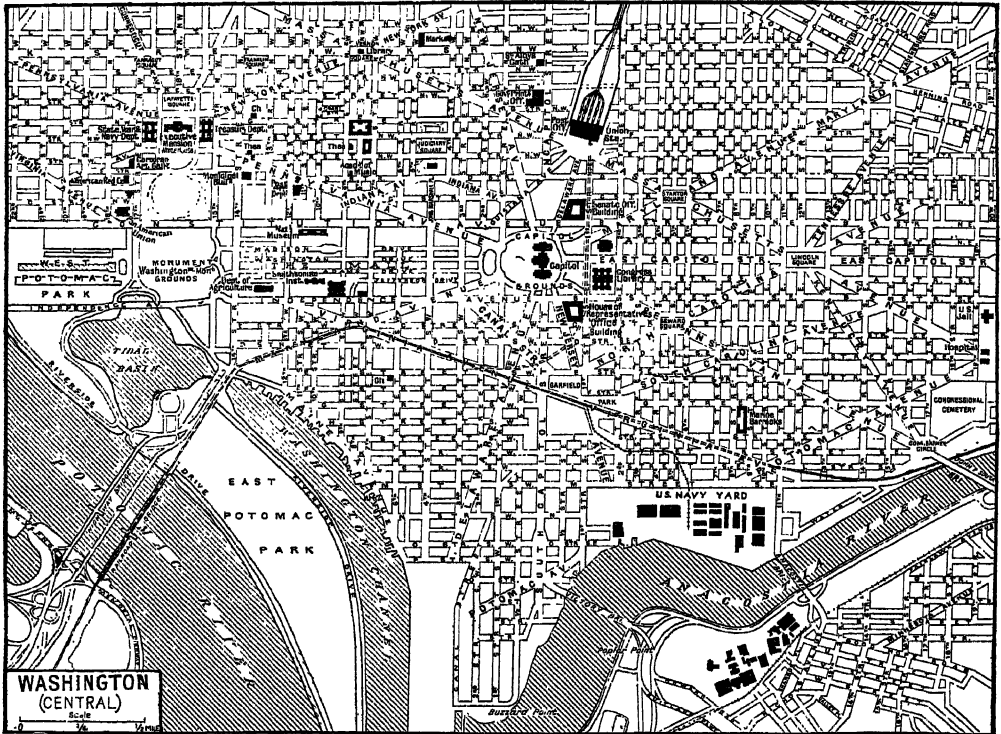
Warwick. The 14th cent. castle. Left, the parish church of S. Mary, largely rebuilt after a fire in 1694

aggrandisement came first, yet he was probably the best administrator and most far-seeing statesman of his time. His life and character are well discussed in Lytton's *Last of the Barons* and in Oman's *Warwick the King-maker*. See *Roses*, *Wars of the*.

Warwickshire. Midland county of England. Its area is 976 sq. m. In the S. it contains spurs of the Cotswold Hills, Edge Hill rising to 826 ft., and in the N. is the forest of Arden, but the greater part of the surface is undulating. The Avon, Tame, and Leam are the chief rivers. The county has a large industrial area, including Birmingham and neighbourhood, also Coventry. Elsewhere agriculture is carried on, this being chiefly dairy-farming and the growing of oats and wheat, but there are orchards and market gardening. The county is served by main rlys. and several canals.

Warwick is the county town; other towns are Leamington, Rugby, Stratford-on-Avon, Nuneaton, Sutton Coldfield, and Bedworth, as well as the greater part of Birmingham; also Kenilworth, Maxstoke, and other places of historic or antiquarian interest. There are six co. and 16 bor. constituencies. Pop. approx. 1,535,000.

LITERARY ASSOCIATIONS. These primarily centre in Stratford-on-Avon, where Shakespeare was born; the country around is rich in Shakespearian associations. At Hartshill, Michael Drayton was born. Shakespeare's contemporary, John Marston, was born at Coventry; that city has given its name to one of the collections of medieval miracle plays, and is further associated with the drama, in that Sarah Siddons was married in Holy Trinity church and Ellen Terry was born in Market Street. Tom Brown's Schooldays tells of Rugby school and the country



Washington, D.C. Plan of the central district of the capital city of the United States of America

constitution, which divides and coordinates legislative, judicial, and executive functions of govt.

In 75 acres of grounds, the White House is a plain, two-storeyed edifice, 170 ft. long, with an Ionic portico, and resembles a country house rather than a state residence. The town house of the dukes of Leinster in Dublin was the model for the original building, which was burned by the British during the war of 1812.

Close to the White House are the principal departmental offices. The Treasury, a massive structure in the classical style, stands at the head of Pennsylvania Avenue, and on the other side of the White House grounds is the great building that houses the State dept. Between the State dept. and the Capitol Pennsylvania Avenue is flanked by govt. buildings, most of them built between the two Great Wars, when the functions of govt. assumed an importance hitherto unknown in the U.S.A. These vast structures are harmonised architecturally under rulings of the fine arts commission, established 1920.

Washington is rich in statues and memorials of the past, the

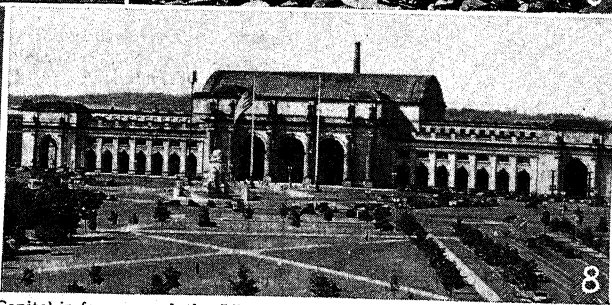
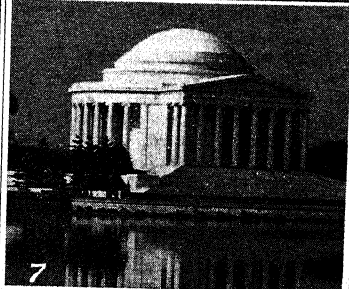
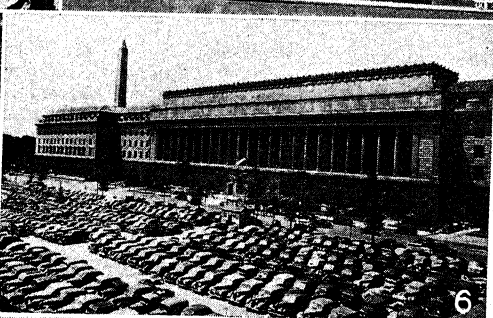
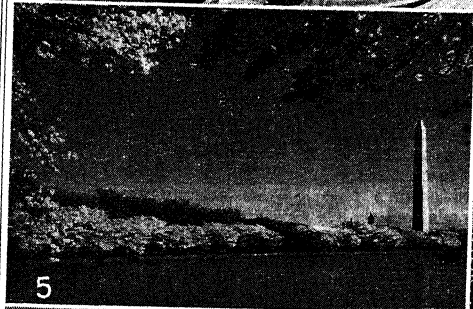
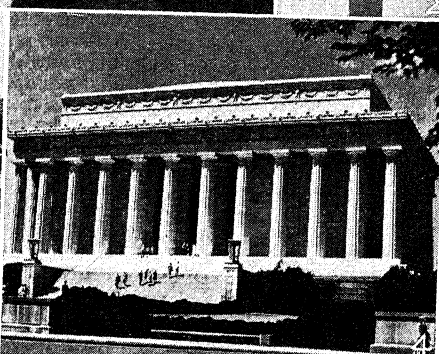
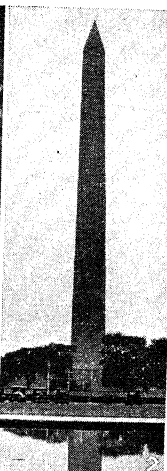
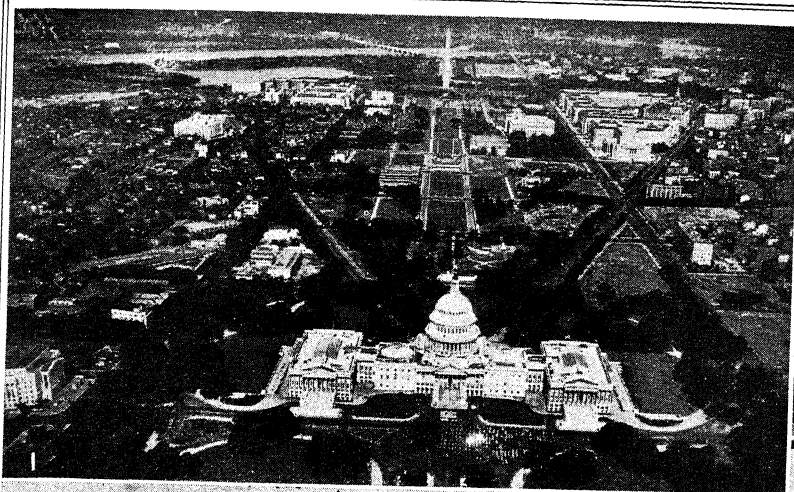
most remarkable being the Washington monument. This stands in its own grounds on the Potomac; clearly visible from both the White House and the Capitol, it is a plain square obelisk of white Maryland marble, 555 ft. high. Facing the Washington monument across lagoons a mile long is the white marble Lincoln memorial, in which a dramatic statue of Lincoln, seated and brooding, is flood-lit night and day. Behind this temple, the ornamental Memorial Bridge leads across the Potomac to the Virginia shore on which, 20 m. away over a 12-lane motor drive, stands George Washington's home at Mount Vernon.

Washington has three universities, the George Washington, the Catholic University of America, and Georgetown. The government employs many scientific experts, besides supporting such institutions as the national museum, the army medical museum, and the botanic gardens. Moreover, in the Corcoran gallery of art is a fine collection of American paintings. The Smithsonian institution, gift to the nation from a wealthy Englishman, is built in a graceful Victorian pseudo-Gothic style; it

is the only example of this style, common in the U.K., among Washington public buildings. The institution houses a scientific collection. Washington is the seat of a U.S. naval shipyard.

Pop. in 1940 was 663,091, of which about a third is negro. Washington dwellers have no vote, the city being governed by commissioners responsible only to congress. Coloured citizens may by law mix freely with whites in public places. The national theatre, largest in the city, was closed in 1948 because the white management would not maintain this equality. About one quarter of the city's pop. live in suburbs which extend into the states of Virginia and Maryland, in which states differing laws prevail as to the association of whites and negroes.

Washington. City of Pennsylvania, U.S.A., the co. seat of Washington co. In beautiful country on Charters Creek, 31 m. S.W. of Pittsburgh, it is served by the Pennsylvania and the Baltimore and Ohio rlys. The surrounding area is fertile; cattle and sheep are raised. The city is a centre of bituminous coal production, and there are oil and gas wells. Manu-



1. Air view of Capitol Hill, showing the Capitol in foreground and the obelisk of the George Washington memorial in the distance. 2. The Washington memorial, 555 ft. high. 3. The U.S. Supreme Court (left)

and the Library of Congress. 4. Lincoln memorial. 5. Japanese cherry blossoms on the edge of the Tidal Basin. 6. Department of Commerce building. 7. Jefferson memorial. 8. Union rly. station.

WASHINGTON: ARCHITECTURAL DIGNITY IN THE CAPITAL OF THE U.S.A.

factures include wool, glassware, steel for tools, tinplate, ferro-alloys, molybdenum, and also chemicals. Washington and Jefferson College and a girls' seminary are here. Historic sites include the house which was the headquarters of the whisky rebellion of 1794. A town was laid out in 1781 and lots were presented to George and Martha Washington. It was incorporated in 1810 and became a city in 1924. Pop. 26,166.

Washington, MOUNT. Loftiest summit of the White Mountains, New Hampshire, U.S.A. Mainly composed of granite, its lower slopes are well wooded, and its N. and E. sides are deeply cut by gorges. It is ascended by road and by rack-rly. Alt. 6,295 ft.

Washington, TREATY OF. Arrangement concluded at Washington in 1871 by the U.K. and U.S.A. Several differences existed between the two countries, notably the American claim for compensation for the damage done by the Alabama (q.v.) in the American Civil War. The treaty provided that the matter should be referred for arbitration to a special and partly foreign tribunal; that the North-Eastern fishery dispute be referred to a mixed commission to meet at Halifax; and that the North-Western boundary dispute be submitted to the arbitration of the German emperor.

Washington, BOOKER TALLAFERRO (1858-1915). American negro educator. A plantation slave,



Booker T. Washington, American negro educator

he was born near Hale's Ford, Franklin co., Virginia, and after the Civil War removed to Malden, West Virginia, where he earned a living first in a salt furnace and then in a coal mine. He studied at the Hampton Normal and Agricultural Institute, 1872-75, and later took a course at the Wayland Seminary of Washington. During 1879-81 he directed the work of Red Indians at the Hampton Institute, and was principal of Tuskegee Institute, Alabama. Through his advocacy of new industrial skills as the salvation of the American negro, he became the most influential negro of his day. He died Nov. 15, 1915. His books include his autobiography, *Up from Slavery*, 1901, and *Working with the Hands*, 1904.

GEORGE WASHINGTON

The life and achievements are here described of the Virginia squire who became first president of the United States of America, an entity of which he had been the chief creator. See American War of Independence

George Washington was born Feb. 22, 1732, at Bridges Creek, Westmoreland co., Virginia, the son of a prosperous planter whose family had emigrated from Northampton to Virginia in the 17th century. His father died while he was a child, and his schooling was irregular. At 16 he was appointed public surveyor of Culpeper co., and a little later adjutant-general, with the rank of major.

Having an ingrained love of adventure, he welcomed in 1753 the difficult mission of crossing some 600 m. of forests sheltering hostile redskins, and of serving notice on the French that their forts on the western lands were regarded as an encroachment. He was rewarded, 1755, by an appointment on the staff of General Braddock, who was sent to evict the French. Braddock's force was destroyed, but Washington's intrepidity in arresting the rout earned for him a high reputation.

Returning to Mount Vernon, the estate which he had inherited, Washington organized the Virginian forces for defence against the Indians. The colonists resented military service, and when, 1759, Washington married Martha Custis, a rich widow, he gladly resigned his command and devoted himself to the administration of her estates and to purely local politics.

In 1765 differences between the British govt. and the colonies became acute. Washington's plan to boycott all goods on which Great Britain levied taxes proved so successful as to cause their repeal with that of the obnoxious Stamp Act, though the tea duty was imposed. In 1774 he was elected to the first continental congress. At the outbreak of the War of Independence, 1775, he was given the chief command.

During the war he was forced to spend much of his own fortune to uphold an army to whose support the colonial exchequer was painfully unequal, and made the scapegoat for every other general's failure. Bewildered by the party hatreds which divided congress, he spent the first year in attempting to introduce order into the muddled organization of the army, and to check enemies on his own side. While so engaged, he was forced to order his troops to retreat; the passage of his army from Long

Island, whence he had been defending New York, through the British lines, although it was followed by a rout which turned his troops into a rabble, was an indication of his spirit; it was followed by a brilliant victory at Trenton, Dec., 1776, the battle that virtually saved the colonists from utter defeat, and by a master-stroke at Princeton, New Jersey, Jan., 1777. The defeats of Brandywine, Sept., and Germantown, Oct., 1777, however, compromised the British.



George Washington

From the painting by Gilbert Stuart in the Fitzwilliam Museum, Cambridge

The ascendancy which Washington possessed over his troops was demonstrated at Monmouth, June, 1778, where, though he was betrayed, Washington turned an inglorious defeat into a victory. The surrender of Burgoyne at Saratoga, meanwhile, seemed likely to change the course of the war, but was followed by a blow from which Washington barely recovered—the defection and treachery of Benedict Arnold, one of his most brilliant officers. Major André, who was associated with Arnold, was caught and hanged as a spy, and Washington was subjected to much odium for this action, which, however, had full military justification. Washington was encouraged by the alliance between the colonists and France, concluded in 1778, and later by the support of Spain against the British. Between Monmouth and Yorktown, 1781, where the surrender of Cornwallis

virtually ended the war, Washington was not engaged actively.

At headquarters, however, near New York, he had a task to which he would doubtless have preferred the utmost dangers of open warfare, for there he had to continue to combat the cabals formed against him, to hearten the frightened congressmen, to retain the friendship of rival foreign soldiers without offending the colonists, and to keep discipline in an undisciplined army. On Dec. 23, 1783, he resigned his commission and retired to Mount Vernon.

The retirement and peace for which he longed were of short duration. Returned as a Virginian delegate to the federal convention of May, 1787, which was called to set up the constitution, he was immediately elected president of the convention and found himself in the position of a dictator. His slightest suggestions were seized upon and made law; he had the largest part, unwillingly, perhaps, in the framing of the constitution, and was almost entirely responsible for its ratification. The office of president which it created was offered to him, and, unable though desirous to refuse, he took the oath of office on April 30, 1789, for four years dating from March 4, 1789.

The success of the first national American govt. was not due entirely to its president; the financial genius of Alexander Hamilton was responsible for the restoration of its credit, and other politicians had their share in building and upholding the new constitution. But Washington was more than a figurehead; to him are in large part due the wide powers which became characteristic of the U.S. presidency. Against the opinions and desires of many of his supporters he ruthlessly suppressed the whisky insurrection, acted with determination against the machinations of France, and showed no animosity towards Great Britain. His signature of a treaty of commerce with Great Britain was much criticised, though Washington was, in fact, laying the foundation of what later became the Monroe Doctrine (*q.v.*). His moderation, and his attempts, mainly successful, to arrange a compromise between the hostile parties of Hamilton and Jefferson alienated many, and though he was unanimously re-elected president in 1793, he had thenceforward to endure many scurrilous and calumnious attacks, especially from the Democratic-Republican party. He refused to stand for a third term in 1797, and

retired once more to Mount Vernon. He died suddenly, Dec. 14, 1799.

Assailed by all the weapons of party politics in his later years, he remained passionless and unmoved. This monumental quality it was that ensured Washington immortality; he represented to later ages an honest steadfastness of purpose which had died in American politics, he stood out as the victor of the only great war with foreigners fought on Union soil, and the chief creator of a constitution which achieved a stability and duration unequalled by any other written constitution.

Bibliography. The most popular and the most inaccurate biography of Washington is that of Mason Weems, 1866, which contains most of the apocryphal anecdotes concerning his childhood and character: other Lives are by J. Marshall, 1804-07; Washington Irving, 1855-59; H. C. Lodge, 1889; C. Sheridan Jones, 1920; W. R. Thayer, 1923; W. E. Woodward, 1926; Woodrow Wilson, new edition, 1927; Rupert Hughes, 1927; John Corbin, 1930; Shelby Little, 1931; Paul Van Dyke, 1931; Norwood Young, 1932; M. de la Bedoyere, 1935. His Writings were edited by W. C. Ford in 14 volumes, 1889-93; and his Messages and Papers were edited by J. D. Richardson, 1896.

Washington Declaration. Agreement signed in Washington Jan. 1, 1942, by the U.S.A., the U.K., Russia, China, Australia, Belgium, Canada, Costa Rica, Cuba, Czecho-Slovakia, Dominican Republic, Greece, Guatemala, Haiti, Honduras, India, Luxemburg, Netherlands, N.Z., Nicaragua, Norway, Panama, Poland, S. Africa, Salvador, and Yugoslavia in which they declared their adherence to the Atlantic Charter (*q.v.*), and pledged themselves to cooperate for the defeat of Germany, Italy, and Japan. Adhesion to this declaration was necessary for invitation to the San Francisco Conference (*q.v.*).

Washington Land. Dist. of N.W. Greenland. Its shore is indented by Kane Basin: to N. is Hall Land, to S. Prudhoe Land.

Washington Naval Treaties. Seven treaties and supplementary agreements resulting from the Washington conference of 1921. The conference was convened by the U.S.A. to consider political conditions in the Pacific. Chief participants were the U.S.A., the British Empire, France, Japan, and China; representatives of Italy, the Netherlands, Belgium, and Portugal also attended. The most important of the treaties were: (1) a five-power naval

treaty which laid down limits in number, size, and armaments of ships for the future navies of the British Empire, the U.S.A., Japan, France, and Italy; (2) a five-power treaty between the same signatories prohibiting the use of submarines as commerce destroyers, and of poison gases, in time of war; (3) a four-power treaty between the British Empire, the U.S.A., France, and Japan to respect the *status quo* in respect of possessions in the Pacific; (4) a nine-power treaty to guarantee the sovereignty, independence, and territorial integrity of China.

These treaties, of which (1) was to remain in force for 15 years and the rest for at least 10 years, were duly ratified by all the powers concerned except France, which rejected a provision regarding the use of submarines.

Washington Post. Round dance for the ballroom, popular in the 19th century, and unusual in that the man's position remained behind his partner throughout. It was danced to the Washington Post march, by J. P. Sousa (so called because it was dedicated to the newspaper of that name). The same march was afterwards often used for the two-step (*q.v.*).

Washita or **OUACHITA.** River of Oklahoma, U.S.A. It rises in the extreme W. of the state, flows S.E. and S. and joins the Red river above Denison, Tex. Length 550 m.

Wasp. Popular name for certain stinging insects of the order Hymenoptera that differ from bees chiefly in their habits. Unlike bees, they feed their brood mostly on premasticated portions of flies, caterpillars, and other insects. True wasps fold their wings into longitudinal creases.

The 290 British members of the family include the potter and mason wasps (*Eumenes* and *Odynerus*), solitary in habit, and seven social species of *Vespa*, the true wasp. The nest of *Vespa* is made in a hole in the ground or on trees or bushes; the hornet (*q.v.*) usually lodges in an old tree trunk. Only the queen wasps emerging in autumn survive the winter. These in spring construct the beginnings of a nest in form of a few hexagonal cells of "wasp-paper," made up of fragments of dry wood mixed and moulded with saliva. An egg is laid in each cell, and in about a month workers (sterile females) begin to hatch. These complete nest building, and feed and tend the larvae. Males and fertile females (queens) appear later and, after mating, these last hibernate.

Wasp. 1. Queen wasp hibernating. 2. Common wasp, *Vespa vulgaris*. 3. Red-banded sand wasp, *Ammophila sabulosa*. 4. German wasp, *V. germanicus*. 5. Combs of a tree wasp with outer covering removed. 6. Solitary wasp, *Eumenes coarctata*, enlarged, on its nest. 7. Wasps' nest that has been formed in a bee-hive



Wasps include the spider hunters or Pompilidae; ruby-tailed wasps or Chrysididae; digger wasps or Sphecidae. See Sting. Consult Hymenoptera Aculeata, E. Saunders, 1896.

Wasp. Name of several British warships. The first Wasp was a fire ship destroyed in Dunkirk roads while attempting to burn some French frigates, July 7, 1800. The second was a 16-gun brig which took part in the Syrian operations in 1840, and in the suppression of the slave trade on the African coast, 1844-46. During the Crimean War Great Britain had a 13-gun Wasp in the fighting line. The last two ships to bear the name both met with disaster. One, a steam gunboat of 465 tons, was wrecked on Tory Island, Sept. 22, 1884, when 52 lives were lost. Three years later a new Wasp, a steam gunboat of 670 tons, was put into commission. In Sept., 1887, she was caught in a typhoon whilst on passage from Singapore to Hong Kong and disappeared.

Wasps, THE. Comedy by Aristophanes, performed 422 B.C. Bdelycleon (Loathe-Cleon) induces his father, Philocleon (Love-Cleon), to forsake the law-courts and try his dog at home for stealing a cheese—an allusion to Cleon's vexatious prosecution of the general Laches. Philocleon, losing his Athenian mania for serving on juries, becomes a lover of the arts.

The chorus consists of wasps. Racine imitated the play in Les Plaideurs. R. Vaughan Williams wrote an overture to The Wasps.

Wassail. Term of Anglo-Saxon origin meaning "May you be in health!" It came to be applied to the salutation used in drinking a person's health, and then for the feast itself. It was also given to a liquor consisting of ale in which were roasted apples, sugar, nutmeg, and other spices. See Health.

Wassermann Reaction. Name given to a laboratory test used in the diagnosis of syphilis. Called after the originator, August von Wassermann (1866-1925), it depends upon a principle known as the fixation of complement. If a poison destructive to blood corpuscles is introduced into blood, the corpuscles are not destroyed until some of this so-called complement has been absorbed. In a

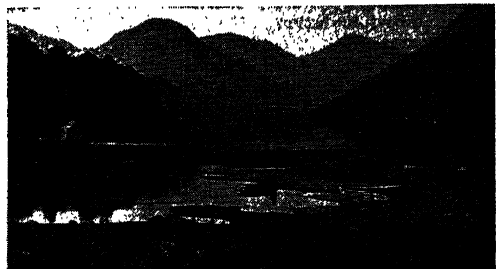
Wassermann reaction the suspected blood serum is mixed with an animal extract and a measured amount of complement. If upon examination the latter is fixed, the suspected serum must have held a substance capable

of joining it to the extract, and the diagnosis is positive for syphilis. There was no poison in the serum if the complement is unfixed.

Waste (Lat. *vastus*). Literally, something desolate or unproductive. The word has a number of allied senses and various compounds (see Desert). Legally it is either doing deliberate damage to land or buildings (voluntary waste), or permitting them to fall into decay (permissive waste). A waste book is a book used by business men for temporary and daily records. Wasting assets are those which are reduced in value as they are worked. Waste pipes are bath and sink outlets, etc.

In another sense waste is the by-products of textile manufacturing. Silk waste is pure silk not readily removable from the cocoon by the ordinary process of reeling, which is sold off and worked up by other methods. Waste cottons of distinct kinds are produced in the successive stages of manufacture, and these are distinguished as hard or soft, according as their nature is thready or fluffy. This waste is put to new purposes, suitable kinds being re-manufactured for the weft of cheap sheetings, to make flannel-ettes and cotton blankets or yarns for knitting. Cotton wadding as used for packing is made from soft classes of waste. Engine waste used for cleaning machinery is made from thread wastes, and clean, pure waste can be converted into guncotton and into artificial silk. Wastes are generated also in carding and spinning wool, and are saved principally to make new qualities of cloth. Rags are also known as waste; and pulled waste is woven stuff returned to its fibrous condition. Textile wastes are tangible articles, and the invisible losses occurring in manufacture are called not waste, but sinkage. See By-Products; Salvage.

Wastwater. Lake of Cumberland, England, in the S.W. of the Lake District. It is about 3 m. long and less than $\frac{1}{2}$ m. broad, and



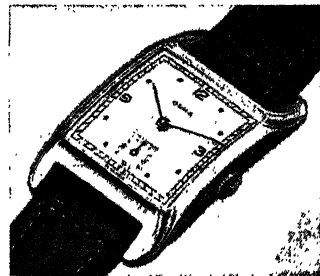
Wastwater, Cumberland, situated among the wildest scenery of the Lake District

is the wildest and deepest of all the English lakes. On one side the Screees form an almost perpendicular wall of rock. The lake is best approached from Seascale, 14 m. away, but there is an hotel at Wasdale Head, a mile N.

Watch. One set to keep watch, usually over a building or the streets of a town during the night. A system of night-watching in cities and borough towns was first instituted in 1253 by Henry III. Watch and ward is the term applied to the uninterrupted guarding of property and persons from lawless violence. See Fire Guard; Firewatcher.

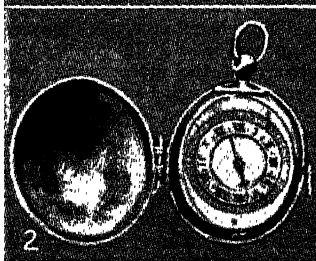
Watch committee was the name given to the committee of the bor. council which controlled the bor. police and concerned itself with prosecutions necessary to preserve public order. By the Police Act, 1946, a separate police force was allowed only to a co. bor. or to a non-co. bor. with a pop. more than half that of the co.

Watch. Naval term applied both to men and to time. In a commissioned ship the seamen are divided into two watches, starboard and port, and each watch is divided into two parts (1st and 2nd). When at sea one watch or part of a watch is always on deck. As regards time, the naval day is divided into seven watches, viz. 1st watch, 8 p.m. to midnight;



middle watch, midnight to 4 a.m.; morning watch, 4 to 8 a.m.; forenoon watch, 8 a.m. to noon; afternoon watch, noon to 4 p.m.; first dog watch, 4 to 6 p.m.; second dog watch, 6 to 8 p.m. The short dog watches are really "dodge watches," their purpose being to make an odd number of duties in the day, and so create an alternation of the watches kept by particular men.

Watch. Small portable machine for measuring time. Portable clocks were in existence as early as the 15th century in Germany (see Clock). But these were too large for the pocket, and the invention of the watch is really due to Peter



Watch. 1. Watch belonging to John Milton, made by W. Bunting, dated 1631. 2. Oliver Cromwell's watch, made about 1630. 3. Memento mori watch, given by Mary Queen of Scots to Mary Seaton. 4. 15-jewel lever movement Swiss-made wrist watch of the type that became popular in the 20th century

No. 4 by courtesy of G. M. Lane & Co., Ltd.

Hele, a clockmaker of Nuremberg, who about 1500 devised the mainspring. The latter was improved by Jacob Zech of Prague in 1525, by the invention of the fusee, a kind of conical pulley interposed between the barrel containing the mainspring and the train of wheels. The fusee helped to correct the unequal power exerted by the spring as the latter unwound.

In 1658 a great step forward was made by the discovery by Hooke of the balance spring for rendering the vibrations of the balance isochronous. Next Hooke introduced the anchor escapement, in 1695 Tompion patented a cylinder escapement, and early in the 18th century Graham brought out his dead-beat escapement. In the

same century compensation balances appeared. (See Escapement.)

The earliest forms of watches had little resemblance to the modern forms. A watch belonging to Mary Queen of Scots was made in the shape of a skull, and such grotesque and curious forms of watches were in vogue for many years. The decoration in enamel for watch cases and dials appeared in the 17th century and was of French origin. In 1820 Thomas Prest patented a keyless watch, and from 1851 the Swiss began to flood the market with watches of this kind.

The plates and wheels of a modern watch are made of brass or nickel; the cases of gold, silver, gunmetal, white metal, etc. The working of an ordinary watch is as follows. The centre pinion rotates once in an hour. On this pinion is fixed the centre wheel, which drives the third wheel pinion. This in turn has fixed on it the third wheel, which drives the fourth wheel pinion. On the latter is mounted the fourth wheel, which drives the escape pinion, and on the latter is mounted the escape wheel. As the centre wheel makes one rotation, the fourth pinion makes sixty, and the escape wheel six hundred. The pivots of the various wheels and pinions are mounted between two plates kept apart by pillars. Usually a portion of one plate is cut away, giving the name three-quarter plate, half-plate, etc. The centre wheel has connected with it wheels driving the hour and minute hands. The seconds hand is mounted on the fourth pinion.

Metallurgical research has recently developed types of nickel in an alloy in which elasticity is scarcely affected by changes of temperature; and some of these alloys (e.g. "Elinvar") are widely used for balance springs for watches. With such springs a special compensation balance is unnecessary, except for precision timekeeping.

The day of the individual hand-made watch is over. Watches are produced in factories in which delicate machinery is used. The fine screws used, weighing 30,000 to the lb., the hair springs and main springs, the tiny pallets, jewels, etc., can be made more accurately and with far greater speed than by hand, and the number of different machines in use runs into several hundreds. The toothed wheels and other parts are stamped out of metal and finished by cutters and milling

machinery. Provided design is good and the necessary care taken in the manufacture and assembly, the modern watch is extremely accurate.

Watchet. Urban dist. and seaport of Somerset, England. It is a rly. terminus, 17 m. N.W. of Taunton. The imports of wood pulp from Scandinavia and coal from S. Wales are used by local paper mills; which employ several hundreds. There are numerous historical associations with the town, which has existed from Anglo-Saxon times. Pop. 2,400.

Water. Chemical compound (H_2O) of hydrogen and oxygen, consisting of one part, by weight, of hydrogen to approx. eight of oxygen, and two, by volume, of hydrogen to one of oxygen. At normal temps. it is a colourless, tasteless, and chemically neutral liquid. In large quantities it has a slight bluish tinge; but the varying colours of water in bulk, as in lakes and the seas, are due to sky reflection, impurities, etc. Under standard pressure pure water boils at $100^\circ C$. ($212^\circ F.$), and as the temp. is lowered its density increases slightly until $4^\circ C$. ($39.2^\circ F.$) is reached, at which temp. one cu. cm. weighs one gram (i.e. 62.3 lb. per cu. ft.). From this point to freezing ($0^\circ C$, $32^\circ F.$) the density decreases slightly. Simultaneously with freezing there is a considerable expansion, amounting to one-eleventh of the volume of water: hence burst water pipes during hard frost. It is this pronounced decrease in density which causes ice to float in water, and, provided the water is fresh and the ice clean and solid, one-eleventh of its volume will project above the surface. A greater fraction than this of an iceberg projects, owing to the saltiness of the water, and the presence in the iceberg of air, in cavities, and of earth.

Increase of pressure has the effect of raising the temp. of the boiling point and lowering, but less markedly, that of the freezing point, and vice versa; e.g. on mt. tops water boils at temps. below $100^\circ C$. Water has a greater specific heat than any known substance except hydrogen. It is used as a standard for measurements of s.g., specific heat, etc. It is a poor conductor of heat and electricity, a powerful solvent of other solid, liquid, and gaseous substances, and is important in chemical action.

In the form of ice and water, the compound is one of the most



Water Buck. Long-horned antelope that herds in swampy places in S. Africa

W. S. Berridge, F.Z.S.

widely distributed in nature. It covers about 72 p.c. of the surface of the globe, constitutes some seven-eighths of animal life and more than 90 p.c. of many plants, and occurs in a large number of minerals. Natural spring waters contain varying amounts of salts and oxides of calcium, magnesium, etc. dissolved from the strata of soil or rock through which they have percolated; certain of these dissolved substances render the water valuable for medicinal and other purposes. River waters contain impurities which depend upon the nature of the surfaces over which they flow, and the uses to which the river is put. Sea water is called brine and contains up to 35 parts in 1,000 of dissolved matter, chiefly common salt. The purest form of ordinary water is that which falls as rain in country districts far removed from areas of industrial pollution. Pure water can be obtained from impure by distillation or freezing.

Water vapour is of great importance in meteorology; evaporation of liquid water from the seas, rivers, vegetation, etc., produces the vapour which is distributed throughout the lower regions of the atmosphere by convection, some of it eventually condensing to form cloud and rain. About three times the bulk of water vapour is required to saturate air at $60^\circ F.$ compared with a similar volume of air at $32^\circ F.$ In the atmosphere water can exist as liquid drops at temps. well below the normal freezing point. See Deuterium; Heavy Water, Ice; Steam; Water Supply.

Water Beetle. Name given to numerous species of beetles aquatic in habit. See Beetle: Dytiscus.

Water Boatman (*Notonecta glauca*). Aquatic bug, common in quiet ponds throughout Great Britain. See Water Bug.

Water Buck (*Cobus ellipsiprymnus*). Species of antelope, occurring in E. and S. Africa. It stands about 4 ft. high at the shoulder, and has a greyish-brown coat with white muzzle and a white ring on the buttocks. It is found in small herds in swampy places.

Water Bug. Aquatic insect of the order Hemiptera, comprising several families, of which many species inhabit ponds in Great Britain. Among these are the pond-skaters (Hydrometridae), with slender bodies and long, thin legs that propel them over the surface, where they live upon insects that have fallen into the pond. The Naucoridæ and Corixidæ are larger insects of oval form, that seek their prey among the submerged weeds. The Nepidæ are represented by the thin, flat water scorpion (*Nepa cinerea*), and the water stick-insect (*Ranatra linearis*); while the chief British member of the Notonectidæ is the well-known water boatman (*Notonecta glauca*), which rows its boat-shaped body under water. See Bug; Hemiptera; Insects.

Waterbury. City of Connecticut, U.S.A., one of the co. seats of New Haven co. It stands on the Naugatuck river, 34 m. S.W. of Hartford, and is served by the New York, New Haven, and Hartford rly. It contains the Silas Bronson library. The city has always been a chief centre of the American brassware industry—it began by making metal buttons—and is noted for the manufacture of watches and clocks; a cheap watch is known throughout the U.S.A. as a Waterbury. Settled in 1674, Waterbury became a city in 1853. Pop. 99,314.

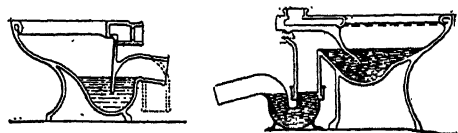
Water Chestnut, WATER CALTROP, OR JESUIT'S NUTS (*Trapa natans*). Aquatic herb of the fam-



Water Chestnut. Rosette of leaves, flowers, and root. Inset, fruit

ily Onagraceae, a native of Europe, Asia, and Africa. It has a rosette of rhomboid floating leaves, their stalks having a spongy dilatation, which renders them more buoyant. The solitary, four-petalled flowers are white, and are succeeded by large, horned fruits which, from their general resemblance to the ancient metal caltrops intended for laming hostile men or their horses, have suggested the name of water caltrops. The contained seed is starchy, and is used for food, as are those of the related species *T. bispinosa* (singharra nut) in India, and *T. bicornis* (ling) in China.

Water Closet. Term, frequently abbreviated to W.C., used for a water-flushed closet con-



Water Closet. Fig. 1 (left). A wash-down pattern water closet. Fig. 2 (right). Double siphonic type

nected to drainage, as distinct from a commode, dry or earth closet, or chemical closet. Early patterns—many made substantially of metal, and incorporating lever-and-link mechanism—have been superseded by the one-piece pedestal-basin of glazed white or coloured vitreous china, a totally non-absorbent porcelain material, or earthenware.

Of several patterns the most important are the single-seal wash-down and the double-seal siphonic. In the first (shown in section in Fig. 1) the flush pipe connexion above the outlet is an extension of the hollow flushing rim that forms the top of the bowl. Wash-down basins are inherently noisy because the clearing of the bowl depends on the velocity with which the bulk of the flushing water is directed upon the inside of the water seal. The siphonic basin (Fig. 2) relies upon atmospheric air pressure to clear the bowl, and is consequently almost inaudible in operation. Another feature is the large area of water in the bowl; this materially reduces the surface exposed to fouling. Siphonage occurs when the first movement of flushing water withdraws air from between the two traps, through the small exhaust pipe. This reduces the air pressure between the seals, and causes the downward thrust of the atmosphere to empty the bowl.

Water Colour. Art and process of painting with colours compounded with an adhesive substance, such as gum or size, and

mixed with water. Water-colour pigments are supplied either in dry cakes or in moist form, in metal tubes or china pans, the moisture being preserved by glycerine or a similar compound. Paintings in this medium are executed either in transparent washes, or in opaque colours (body colour), or in a combination of the two; and owing to the quick drying of the pigments, the medium is the favourite one for rapid sketching.

Although processes akin to water-colour painting were employed by the ancient Chinese, Egyptians, and Greeks, the first use of the medium, as now understood, need not be traced farther back than the missal painters of the early Christian era, when it was used as an alternative to gouache. Late in the 15th century prints of engravings were often tinted with water colours. Dürer made outline

drawings with a reed pen, and filled in the spaces with water-colour washes. Rembrandt and Rubens employed water colour in much the same way. In their hands, however, and those of other Dutch, Flemish, and German masters, water colour was really a stain in monochrome, heightened only by a few local tints or dashes of strong colour; and this partly "stained" drawing lasted till well on in the 18th century, when it was ousted by the fully tinted type.

It was in the former way that water colour was used by the topographical English draughtsmen of the early 18th century, who lived their laboured productions with blue, grey, or brown tints in order to give them some faint resemblance to natural colouring. But Gainsborough's studies, in which he experimented with water colour as with nearly every other medium, foreshadowed greater pictorial possibilities. Paul Sandby (1725–1809), called the father of the English water-colour school, was a topographical draughtsman, who not only established the ascendancy of the completely tinted drawing over the monochrome and partly tinted type, but introduced a fair measure of personal expression into a hitherto mechanical style. Alexander and J. R. Cozens, W. Payne, and Nicholas Pocock were others of his school. But it was Thomas Girtin and J. M. W. Turner, at the beginning of the 19th century, who established the

full strength of British water colour.

In 1805 the first exhibition of the newly formed Water Colour Society was held; and within the next half-century David Cox, Peter De Wint, Copley Fielding, J. S. Cotman, R. P. Bonington, W. Callow, J. D. Harding, and W. H. Hunt had made their great reputations in water-colour landscape. The medium, in their hands, was made to appear peculiarly suitable for suggesting the soft atmosphere of the English scene; but the field was extended to every branch of painting.

In France, the example of Bonington stimulated water-colour painting among the Romanticists, especially Géricault, Delacroix, and Decamps. German water colourists of a later date include Schwind, Hildebrandt, and Menzel. The modern Dutch school, particularly Israëls and Anton Mauve, produced remarkable results in the medium. Fortuny in Spain initiated a crisp, sparkling manner that was largely followed in Italy. See Painting.

Bibliography. Modern Water Colour, R. Fedden (new edn.), 1934; Water Colour Painting of Today, A. Bury, 1937; On the Mastery of Water-Colour Painting, A. Hill, 1940; English Water Colours, L. Binyon, 1944; English Water Colour Painters (Britain in Pictures Series), H. J. Paris, 1945.

Water Colours, ROYAL SOCIETY OF PAINTERS IN. British art organization. Founded in 1804, this society confines its exhibitions to works by members and associates. Among early exhibitors were Cotman and Peter de Wint; later members included Sir D. Y. Cameron and Sargent. The president was Sir W. Russell Flint in 1948, when the society held its 230th exhibition. Its galleries are at 26, Conduit Street, London, W.1.

Water Crane. Hollow standpost connected to a water main. It has an overhead pipe arm, which projects outwards and can be swung over a locomotive or water cart. A valve is fitted either below ground in the connexion to the water pipe, or in the body of the standpost. The end of the crane arm is usually fitted with a few feet of canvas or leather hose, to allow for slight variations in the position of the tank to be filled.

Watercress (*Nasturtium officinale*). Perennial aquatic herb of the family Cruciferae. A native of Europe, W. Asia, and N. Africa, it has stout, firm, hollow, creeping stems, which root in the mud. The alternate leaves are divided into



Watercress. Edible leaves and roots.
Inset, spray of flowers and pods

from three to six pairs of somewhat heart-shaped leaflets, often of an olive tint. The small, white flowers are clustered in short sprays. The fruit is a small pod. It has a hot biting flavour, and has been esteemed from ancient times as a salad herb and anti-scorbutic.

Water Cure. Treatment of disease based upon the application of water to parts of the system. See Baths; Hydropathy; Spa.

Water Divining. This subject is treated under Divining Rod.

Water Dropwort or **HEMLOCK DROPWORT** (*Oenanthe crocata*). Perennial marsh herb of the family Umbelliferae, native of Europe. It has parsnip-like root-fibres an inch thick; a grooved, stout, hollow stem 2-5 ft. high; and large, wedge-shaped leaves, several times divided into small wedge-shaped segments. The minute white flowers are clustered in numerous little umbels associated in compound umbels. They give off a wine-like odour. The juice turns yellow on exposure. The plant is poisonous and accidents have been caused by its being mistaken for celery.

Water Equivalent. Physical term which expresses the heat capacity of a body in terms of a thermally equivalent mass of water.

Waterfall. Fall or perpendicular descent of the water of a river or a stream. Waterfalls are usually found in the upper or mountain courses of rivers, but they may occur at any point where the river flows from hard to soft layers of rock, or hard layers cover soft.

The top of Niagara Falls is of limestone, which is much harder than the softer beds of shale upon which the limestone rests. See Hydro-Electric Installations.

Water Flea. Popular name for the small crustacean, *Daphnia pulex*, found in ponds. See Daphnia.

Waterford. County of Munster, Ire. In the S., it has an area of 713 sq. m. and a coastline of 50 m.,

thereon being the harbours of Waterford (itself the estuary of the Suir, Nore, and Barrow), Dungarvan, and Youghal, and the natural harbour of Tramore Bay. The surface is chiefly hilly, the Knockmealdown range attaining a height of 2,609 ft. The land is generally more suitable for pasture than tillage, and cattle have supplanted sheep as the principal livestock. Wool is produced for home consumption. Chief industries include brewing and flour-milling, while salmon are caught. Some of the best Irish marble is quarried. Waterford is the county town; other places are Dungarvan, Lismore, Tramore, and Cappoquin. Overlooking the sea at Ardmore is a Gaelic round tower, 95 ft. high; this town was once a bishopric and has remains of a cathedral. Mount Melleray is a Trappist monastery. Ravaged by the Danes in the 9th century, Waterford was settled by the English in the 12th. It elects 4 members to the Dáil. Pop. 104,489.

Waterford. Municipal and co. bor. and chief city of co. Waterford, Ire. It is near the confluence of the Suir and Barrow, 94 m. S.S.W. of Dublin. A rly. junction, it has steamer connexion with Fishguard and Bristol. The rly. from Rosslare runs across a great viaduct, and a bridge goes across the Suir to the suburb of Ferrybank. Tramore, 6 m. S., is a seaside resort. Bacon, butter, and cattle are exported; industries include bacon curing, brewing, flour milling, shipbuilding, and ironworking. The chief buildings are Protestant and R.C. cathedrals, town hall, theatre, schools, and monastic establishments. Deep prismatic cut glass with early 19th cent. patterns is popularly called Waterford glass.

The city's past is recalled by the 11th century Reginald's Tower. Waterford was a Danish stronghold until its capture by Strongbow in 1171. In John's reign was built a leper house still functioning as an infirmary. Waterford resisted Cromwell in 1649, but surrendered to Ireton next year. James II embarked here as an exile for France; and William III sailed hence for England. Pop. 28,332.

Waterford, MARQUESS OF. Irish title held by the family of Beresford since 1789. The family was founded by Sir Tristram Beresford (d. 1673), M.P. for Londonderry, whose great-grandson, Sir Marcus (1694-1763), married the heiress of the La Poers, viscounts of Tyrone. He was created Baron Beresford, and in 1746 earl of Tyrone. His son George (1735-1800), who suc-

ceeded as 2nd earl in 1763, was created marquess of Waterford in 1789. From him the descent has been in direct male line to John (b. July 14, 1933), 8th marquess. The U.K. barony of Tyrone, granted in 1786, enables the marquess to sit in the house of lords. An eldest son is styled earl of Tyrone. The country seat is at Curraghmore, Waterford.

Water Gas. Gas made by passing steam over red hot coke or carbon. See Gas, p. 3665.

Water Gauge. External glass tube, communicating at both ends with the interior of a steam boiler, to indicate the level of the water inside. The connexions include cocks to cut off water and steam in case the glass bursts: and, in some gauges, automatic safety ball-valves as well.

Water-glass. Sodium silicate. It is known also as soluble glass, because it resembles glass in appearance, but by the prolonged action of water it can be dissolved. Double water-glass is a mixture of equal parts sodium and potassium silicates. As found in commerce sodium silicate is a thick liquid, which can be thinned by water. The method of manufacture is to fuse on the bed of a reverberatory furnace the following mixture: sodium carbonate 22 or 23 lb., white sand or powdered flints or quartz (prepared by heating to redness, quenching in water, and grinding) 44 or 45 lb., charcoal in powder 3 lb. After fusing the mass for eight or ten hours it is withdrawn, broken up, and dissolved by prolonged boiling in water. Potash water-glass is made by a similar process, potassium carbonate replacing sodium carbonate.

An early commercial use of water-glass was the Ransome patent process of preserving stone. The method is to coat the stone with water-glass and, when dry, apply calcium chloride solution. The calcium silicate forms a dense film over stone so treated. In soap-making sodium silicate confers hardness and durability, especially on coconut-oil soaps. The salt-glazing of earthenware is an example of the use of sodium silicate as a protective agent; the same substance is also used in dyeing and calico-printing, for the preparation of unflammable wood and paper, as a medium for fresco-painting, and for mending stone. A modern use of water-glass is as a preservative for eggs.

Water Hemlock (*Cicuta virosa*). Perennial marsh herb of the family Umbelliferae. See Cowbane.

Water Hen (*Gallinula chloropus*). British water fowl, also known as moor hen. Its plumage is dark olive brown on the upper parts, and dark grey on the head, neck, and underparts. Distinguished by the red frontal plate above the beak, it is common about water in most parts of the British Isles, and is an expert swimmer and diver. It nests among the reeds, and its food consists mainly of slugs, worms, and insects.



Water Hen. British diving bird that nests among the reeds

Waterhouse, ALFRED (1830-1905). British architect. Born in Liverpool, July 19, 1830, he studied in Manchester and abroad. He began to practise in Manchester, but in 1865 removed to London. In 1878 he was made A.R.A., becoming R.A. in 1885, and he died in



Alfred Waterhouse, British architect

Manchester, Aug. 22, 1905. Waterhouse made his reputation by designing the assize courts and town hall in his native city. He was also responsible for Eaton Hall and other residences, and in London the Natural History Museum, New University Club, National Liberal Club, and various neo-Gothic buildings. He designed Girton College (q.v.) and did work on other colleges at Oxford and Cambridge, and was responsible for S. Paul's school and University College, Liverpool. Michael Theodore Waterhouse, P.R.I.B.A. 1948-50, was his grandson.

Waterhouse, JOHN WILLIAM (1849-1917). British painter. The son of an artist, from whom he received most of his training, he first exhibited at the R.A. in 1874. He became A.R.A. in 1885, R.A. after ten years, and died Feb. 10, 1917. Among his paintings, executed after the style of Burne-Jones, are *The Martyrdom of S. Eulalia* (Tate Gallery); *The Magic Circle*, purchased by the Chantrey Bequest; and *Hylas and the Nymphs*, purchased by the corporation of Manchester.



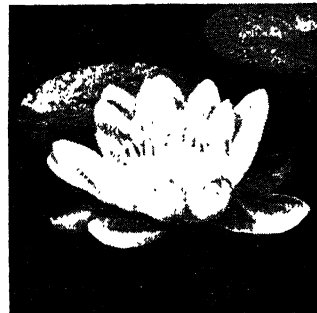
J. W. Waterhouse, British painter

Water Hyacinth (*Eichhornia crassipes*). Perennial aquatic herb of the family Pontederiaceae. A

native of S. America, it has a thick rootstock and large, round, fleshy leaves whose stalks are swollen. The large, violet, funnel-shaped flowers are clustered. The plants often float on the surface of the water, and propagate to such an extent that they block the rivers.

Water Lily (*Nymphaeaceae*). Family of about 60 perennial aquatic herbs, natives of temperate and tropical regions. The flowers are white, pink, red, and yellow. The commonest water lily is the British *Nymphaea lutea*, and the finest the S. American *Victoria regia* (q.v.).

Water lilies thrive best in still water. The plants should be sunk



Water Lily. Opening flower of *Nymphaea alba*

to a depth of about 2-3 ft., in an old fish or game basket full of rich loam. If planted in the spring, the plants will flower during the summer of the same year. The cultivation of tropical species requires specially prepared tanks, in which the temperature of the water is never allowed to fall below 65° F. The lilies should be planted in large pots full of rich loam and well decayed manure, and plunged about one foot below the surface of the water. They require repotting annually in early spring. See Leaf; Lotus.

Waterloo. Town of Ontario, Canada, in Waterloo county. It is situated nearly 50 m. N.W. of Hamilton, adjoining Kitchener, on the C.P.R. and C.N.R. Chief manufactures are brooms and brushes,

furniture, boots and shoes, shirts, and hardware. Pop. 9,512.

Waterloo. City of Iowa, U.S.A., the co. seat of Blackhawk co. It stands on the Red Cedar river, 52 m. N.W. of Cedar Rapids, and is served by the Illinois Central and other rlys. The chief industries are canning and meat packing, and the manufacture of agricultural implements, petrol engines, foundry and machine-shop products, cigars, and bricks. There are also large rly. workshops. Settled in

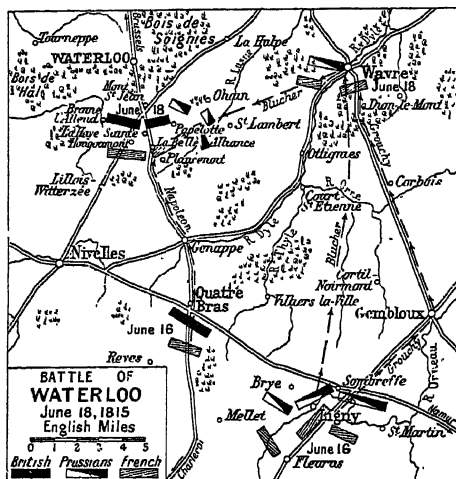


Water Hyacinth. Cluster of flowers and fleshy leaves, showing the swollen leaf-stalks

1850, Waterloo was incorporated in 1868. Pop. 51,743.

Waterloo, CAMPAIGN OF. Military operations between the British with their German and Dutch allies and the French that culminated in the battle of Waterloo, June 18, 1815. Waterloo is a village 11 m. S. of Brussels, in Brabant prov., Belgium. Near it is Mont St. Jean, after which height the French name the battle. Memorials mark its site.

On June 12 Napoleon had over 120,000 men on the Belgian frontier. Around Namur was a Prussian army under Blücher, about equal in strength. Wellington at Brussels in command of 90,000 men, of whom about a third were British, expected Napoleon to march upon that city. The first fighting took place on the 16th, the French attacking the Prussians at Ligny and St. Armand. The battle lasted until evening, when the Prussians, having lost 20,000 men, retreated towards Wavre. The French lost rather fewer. At the same time, in pursuance of Napoleon's plan of attacking the two hostile armies separately, the allies were also engaged at Quatre Bras, 6 m. away. There some Dutch and Belgian troops withstood furious French attacks, until a British detachment under Picton arrived from the neighbourhood of Brussels. This battle, too, was inde-



Waterloo. Plan showing the disposition of the opposing forces and the battlefields of the campaign against Napoleon in June, 1815

cisive, but the French fell back, their failure being ascribed to the fact that a corps under D'Erlon, having received contradictory orders from Napoleon at Ligny and from Ney at Quatre Bras, appeared to support neither. Each side lost about 4,000 men.

On the 17th, while Napoleon hesitated, the British concentrated at Waterloo, save 17,000 men at Hal and elsewhere. Napoleon, who had detached 33,000 men under Grouchy to follow the road he thought the Prussians would take, hurried with the remainder of both armies after the British. At Gemappe there was a skirmish, after which the two armies spent the night, a wet one, on the morrow's battlefield. Wellington had now 67,000 men under him; Napoleon had 74,000 and was stronger in both cavalry and artillery. The British infantry (18,847) were organized in 36 battalions, the British cavalry (7,448) in 21 regiments. The divisional commanders were Cook (1st), Clinton (2nd), Alten (3rd), Colville (4th), and Picton (5th). Uxbridge commanded the cavalry. The artillery under Wood formed 26 to 30 batteries of six guns each. Before the British were the farmhouses of La Haye Sainte and Hougomont. The divisions of infantry composed the line, with reserves and cavalry behind.

The French at 11.30 on Sunday forenoon opened the battle. On the British right a fierce struggle took place for Hougomont defended by the Guards; on the left, after a long cannonade, the Dutch and Belgians gave way, but the position was saved by a charge

made by Picton's division. The cavalry took advantage of this success and returned with many prisoners, although they suffered heavily in the exploit. The French strove hard around La Haye Sainte in the centre, but here, too, their efforts to pierce the British front were unavailing until about 6 p.m., when they seized the farmhouse; which they were soon forced to abandon. Meanwhile the French cavalry were

making their memorable series of charges upon the British squares. These failed, although the defenders paid a heavy price for their steadiness. In the afternoon, too, the Prussians, hurrying from Wavre, came in touch, but a force, detached by Napoleon to meet them, succeeded in forcing their leading troops back.

The emperor then made his final attempt at victory. The Imperial guard were ordered forward, and under Ney the veterans advanced, as did the remnants of the other troops. They were close when Wellington gave the word and the British guards, having fired, dashed forward with the bayonet. An advance of the whole line followed. The attackers were thrown into confusion just as the vanguard of Blücher's army came on the field. The British cavalry dashed forward to complete the victory; the whole army followed, and soon the French were in flight, pursued by the avenging Prussians. The losses of the British and their auxiliaries were 30,000: the Prussians lost 7,000 and the French 37,000, including prisoners.

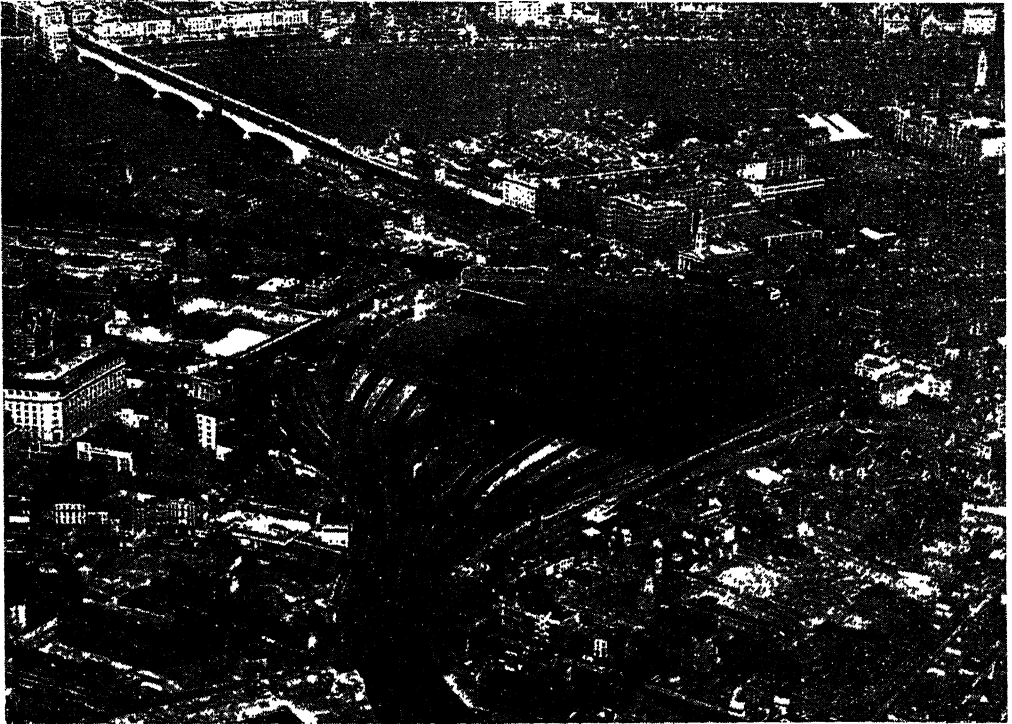
This campaign and battle have been the subject of many studies, among which may be mentioned those by J. C. Ropes, 1893; H. Houssaye, Eng. trans. 1900; A. Pollio, 1906; S. C. Pratt, 1907. Their chief appearance in English fiction is in Thackeray's *Vanity Fair*. Byron in *Childe Harold's Pilgrimage*, and Hardy in *The Dynasts*, gave poetic treatment. See *Belle Alliance Farm*; Napoleon; Wellington.

Waterloo Bridge. London bridge across the Thames between Wellington Street, Strand, and Waterloo Road, Lambeth. The first bridge, designed by George Dodd, was built by a company of which John Rennie was chief engineer. The foundation stone was laid on Oct. 11, 1811, and the bridge was opened to traffic on June 18, 1817, the second anniversary of the battle of Waterloo. Built of granite, it consisted of nine elliptical arches, 35 ft. high and with a span of 120 ft., springing from piers 20 ft. wide and flanked by Doric columns. The bridge was 2,456 ft. long, including the Strand approach and the Surrey side causeway. In 1924 the roadway subsided owing to settlement of the central pier. The bridge was given timber supports, and its use was restricted to S-bound traffic, a temporary steel structure being built to carry N-bound traffic. After controversy it was decided to demolish the old bridge and construct a new one, the whole operation costing £1,500,000.

Designed by Sir Gilbert Scott, the new Waterloo Bridge follows the line of the old. Construction began in 1935, and one side of the bridge was opened to vehicular traffic on Aug. 11, 1942. The whole was formally opened on Dec. 11, 1945. It is built of steel and concrete and faced with Portland stone. The roadway, 58 ft. wide, accommodates six lines of traffic. The bridge is carried across the river on five



Waterloo Bridge, London. The up-stream side of the first Waterloo bridge, seen from the Victoria Embankment. The second bridge, opened in 1942, is shown among the illustrations of Bridges, p. 1422



Waterloo Station, London. Air view of the main Southern region rly. terminus. In the background is Waterloo bridge, and Second Great War air raid damage is visible here and there. The buildings between the station and the river on the left of the bridge were later demolished to provide the site for buildings of the 1951 Festival of Britain

spans of 238 ft. each, with a minimum height above water of 30 ft. Under the roadway on the S. side are incorporated columns and a small section of the parapet of the old bridge as a memorial to Rennie. The temporary steel structure, dismantled in 1943, was transported to the Netherlands after the Second Great War; parts of it were incorporated in temporary bridges across the Moerdijk, the Rhine at Oosterbeek, near Arnhem, the Maas at Venlo and at Dordrecht, and the Zwartewater at Zwolle, to replace bridges destroyed by the Germans. See Bridge illus. p. 1422.

Waterloo Cup. Coursing competition, the chief of its kind. It is held normally every year in Feb., at Altcar, near Liverpool. It originated in 1836 and owes its name to the fact that its leading promoter was landlord of the Waterloo Hotel, Liverpool.

Waterloo Place. A London thoroughfare. It crosses Pall Mall, S.W.1, and runs S. from Regent Street to St. James's Park. The N. section was once notable for its publishing houses; the S. has many monuments and statues, including the Guards' Crimean War

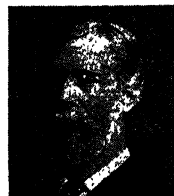
monument, Duke of York's column, and statues of Lord Herbert of Lea, Florence Nightingale, Edward VII, Captain Scott, Lord Clyde, Lord Lawrence, Sir J. Franklin, Burgoyne. On the S. side of the junction with Pall Mall are the Athenaeum and United Service club. See Column; Scott, R. F.

Waterloo Station. Principal station in London of the Southern region of British rlys. It was opened on July 11, 1848, as the London terminus of the London and South-Western rly., and had four platforms handling 68 trains daily. The station was enlarged in 1860 and 1885, and in 1922 was completely rebuilt as h.q. of the newly-formed Southern rly. It is the largest rly. station in Great Britain, covering 24½ acres; its 21 platforms (the longest 860 ft.) handle 1,550 trains and 120,000 passengers daily, for Waterloo is the terminus of electrified lines to the suburbs and beyond. From it depart the boat trains for Southampton Docks. The main archway forms a memorial to the 585 L. and S.W. rly. employees who lost their lives in the First Great War. The forecourt was damaged by German bombs in 1940.

Situated on the S. bank of the Thames, the station forms a triangle between Waterloo, York, and Westminster Bridge Roads, and is connected with the Waterloo and City and the Bakerloo underground lines. It still has a toll house where formerly rly. police collected tolls from all cabs entering the station. A centenary exhibition at the station in 1948 illustrated its history.

Waterloo-with-Seaforth. Former urban dist. now absorbed in the bor. of Crosby, Lanes, England. Waterloo is really a sea bathing resort for Liverpool people, being 6 m. N. of that city on the Mersey estuary.

Waterlow, SIR ERNEST ALBERT (1850-1919). A British painter. Born in London, May 24, 1850, he was educated at Eltham and Heidelberg, and in 1872 entered the R.A. school, gaining the Turner gold medal in 1873. Member of the Royal Society of Painters in Water Colours, 1880, and in 1897 president,



Sir Ernest Waterlow, British painter

he was elected A.R.A. in 1890, and R.A. in 1903. He was knighted in 1902. His Galway Gossips was bought by the Chantrey trustees. Popular pictures were A Sussex Homestead, Green Pastures, A Moorland Road, Warkworth Castle, and Hemingford Mill. Waterlow died Oct. 25, 1919.

Waterlow, Sir Sydney Hedley (1822-1906). British merchant. Born in London, Nov. 1, 1822, he was the son of a stationer. He attended schools at Brighton and Southwark, and became a printer under his uncle. In 1864 he started a printing department in connexion with his father's business, and this became the firm of Waterlow and Sons. In 1857 Waterlow became a member of the city corporation, and was lord mayor in 1872-73. Knighted in 1867, he was made a baronet in 1873. He sat in parliament as a Liberal 1868-69, 1874-80, 1880-85, and died Aug. 3, 1906, having presented to the public his house at Highgate and the grounds which now form Waterlow Park. A great-nephew, Sir William Waterlow (1871-1931), was lord mayor of London 1929-30; his son, Sir (William) James (b. 1905), became a director of The Amalgamated Press, Ltd.

Waterman. One who plies for hire in harbours, on rivers, canals, etc., as ferryman or boatman, as distinct from a sailor who serves on the high seas. In the 17th century as many as 3,000 were employed on the Thames. The Thames watermen annually compete for Doggett's Coat and Badge (*q.v.*). Formerly the word was also applied to a man who provided horses with water at a cab rank and, in folklore, to a water demon. See Taylor, John.

Water Mark. Device produced in the manufacture of paper. It is made by pressure of a projecting design woven in the wire gauze on the dandy roll, so making the web of moist paper thinner where it comes in contact with the design. See Paper.

Water Meadow. Term used by agriculturists for a piece of land that is kept fertile by allowing the water from an adjoining stream to flow through it in irrigation channels. See Pasture.

Water Melon (*Citrullus vulgaris*). Trailing perennial plant of the family Cucurbitaceae. See Gourd; Melon.

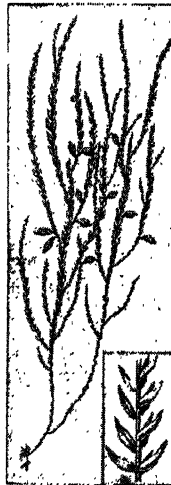
Water Mite. Minute aquatic creature of the order Acarina, of the class Arachnida (*q.v.*). More than 200 species are British, many

being of a characteristic red colour. The genus *Hydrarachna* in its larval stage lives as a parasite attached to the skin of water bugs and other creatures. Water scorpions (*q.v.*), dragon flies, and others are often seen with these minute orange or red larvae attached to them. Adult mites are free living.



Water Moccasin. Venomous snake that haunts shallow waters of the southern U.S.A.
W. S. Berridge, F.Z.S.

Water Moccasin (*Ancistrodon piscivorus*). Venomous aquatic snake of the southern U.S.A., also called cotton-



Water Moss. Branching stems of leaves and flowers. Inset, leaves

Bryaceae. It is attached to stones, chiefly in running water. It has long, branching stems, with leaves arranged in three series.

Water Music. Composition by Handel. This set of instrumental pieces composed in 1715 was scored for four violins, viol, cello, double bass, two oboes, two bassoons, two horns, two flageolets, flute, and trumpet. According to one account it restored Handel to George I's favour. Baron Kielmansegge arranged a picnic party on the Thames for the royal family on Aug. 22; the party proceeded in

barges from Whitehall to Limehouse, and the baron persuaded Handel to supply music to be played in a barge directly following. According to E. J. Dent, two different sets of music were composed. In any event, the pieces were collected for publication in 1740. Nowadays six are usually played in Hamilton Harty's arrangement.

Water Ousel. Popular name for the bird called the Dipper (*q.v.*).

Water Polo. Aquatic ball game. It is played with a ball not less than 27 ins. and not more than 28 ins. in circumference. Competitions are held in a swimming bath or open water. The distance between goals varies from 19 to 30 yards, width of the

playing space being not more than 20 yards. The goal is 10 ft. wide and 3 ft. above the water level. A team is 7 players, generally divided into three forwards, one half-back, two backs, and a goalkeeper. Only one hand may be used, and it is a foul to touch the ball with both hands at the same time. The duration of play is 7 mins. each way, the ends being changed at half-time.

With the coming of the Amateur Swimming Association rules were framed and the game was taken up by nearly every club in England. The first club water polo championship under the association rules was held in 1888, since which date district and county annual matches have been inaugurated. The sport also figures in the Olympic Games.

Water Power. The use of water power to provide electricity for industry is described under Hydro-Electric Installations. The greatest schemes of this kind are also described separately, e.g. Boulder Dam, Dnieper Dam, Grand Coulee Dam, Niagara Falls, Sennar Dam, Shannon, Tennessee Valley Authority. For details of the technical devices involved, see Hydraulics; Water Turbine; Water Wheel.

Waterproofing. The treatment of textiles, paper, and other materials to make them resist penetration by water, or even to be capable of holding water without leakage when made into a bag or similar object. On textiles waterproofings are of two types: water-repellent, in which the fabric resists penetration of water while still porous and thus allowing the passage of air; and impervious, in which the fabric

is completely covered by a continuous film of rubber or similar material, and neither water nor air can penetrate.

Under the heading of water-repellent treatments fall the various showerproofings used on gaberdine raincoats, etc., where (for a time at least) rain runs off in small droplets without wetting the fabric. The repellent effect is produced by treating the fabric with a solution of an aluminium salt either alone or in conjunction with soap; with an emulsion of wax; or with a combination of the two. A method frequently suggested for home re-proofing of raincoats is to soak in a mixture of lead acetate and alum solutions. This must be done with care, remembering that lead acetate is a dangerous poison.

In commercial proofing aluminium acetate or formate is used ready prepared, and special preparations containing both the aluminium salt and a stable wax emulsion are known. These proofings have the defect that when the garment is washed or dry-cleaned they are almost completely removed. In durable proofings, complex fatty chemical compounds are made to combine chemically with the textile material; these proofings resist washing or cleaning, but can be applied to cloth only before it is made up into garments.

In the impermeable type, fabric is coated with a film of rubber or synthetic rubber, on one side or on both; or (as in double-texture mackintoshes) the rubber layer is between two layers of cloth and cements these together (see Coated Fabrics). Another process is oil-proofing, where the fabric is soaked in linseed oil or special varnishes, and then baked; this is used for oiled silk, cycling capes, and for anti-gas clothing. Nylon can be impregnated with a plastic material. Still another type of process, used on cotton, is to treat it with a solution of a copper compound which softens and partly dissolves it. When the material is passed between heavy rollers the fabric interstices are closed, and after washing and drying the fabric is impermeable. Railway waggon covers are proofed with mixtures of bitumen and pigments.

Paper is waterproofed by coating or impregnating with wax, bitumen, linseed oil, varnishes, or synthetic resin lacquers; cellulose film by giving it a thin coat of nitro-cellulose lacquer. Some

compounds of silicon make the surface of materials, including glass, permanently water-repellent. See Silicones.

F. V. Davies, B.Sc.

Waterproof Paints. This term covers substances varying from paints of the ordinary type, to which materials have been added to improve water-resisting qualities, to compositions of materials of high resistance to water. The cheapest and most generally used materials are the pitches and bitumens. Coal-tar pitch is a frequent ingredient of paints and compositions alike. Natural asphalts and bitumens, including those obtained from petroleum distillation, are widely used, frequently blended together with the addition of waxes. Suitable varieties of bitumen can be introduced into oil paints and varnishes, though they darken the colours. Metallic soaps, especially the palmitates and stearates of aluminium, do not affect the colour of paint. Rubber and its derivatives may be used where chemical resistance as well as waterproofing is necessary. Rubber latex emulsified with waxes or mixed with casein in alkaline media forms the basis of a variety of preparations. Oxidised rubber is compatible with a variety of organic solvents and with the ordinary natural resin-oil varnishes, giving highly water-resistant coatings, particularly if tung oil (china wood oil) be used in the oil medium. Chlorinated rubbers are also used. Of the synthetic resins, the chlorinated diphenyls have high resistance to heat as well as water; they are compatible with the ordinary constituents of paint and varnish.

Water Rat. Popular but erroneous name for the water vole (*Arvicola amphibius*). See Vole.

Water Rights. Term in English law. By the common law, if one wishes to convey a pool or river, it should not be described as "water," but as "land covered with water," i.e. the grant of the land includes the water that is on it. A mere grant of water does not convey the ground on which the water is, though it would pass the right of fishing in the water named, and the right of navigation. Where a river or stream, in a well-defined

channel either above or below ground, passes through the land of several proprietors, those below have a right to the full and free, uninterrupted flow of the water, and an upstream owner must not divert the water, or dam it up so as to lessen the flow. Water which has no defined channel, but merely percolates through the land by the force of gravity, is not the subject of property. See Riparian Owner.

Water Scorpion. Family of water bugs (Nepidae), some of which are common in the ponds of Great Britain.

The curved fore-legs and the tail-like appendage to the abdomen gives this insect something of the appearance of a scorpion. The tail is really a breathing tube, and is raised above the surface when the insect comes up for air.



Water Scorpion, *Nepa cinerea*, about natural size

Watershed

(Ger. *Wasserscheide*), **WATER PARTING**, OR **DIVIDÆ**. Height of land separating river basins. The Pennine Chain, for example, forms the watershed between the rivers draining the W. and E. slopes.

Watersmeet. Spot near Lynmouth, Devon, England, where the Combe Water joins the East Lyn river. The famous walk to this point is National Trust property.



Watersmeet, Devon. The confluence of the Combe Water and the East Lyn river near Lynmouth

Water Snake. General name for snakes of the genus *Natrix*. Natives of the temperate and tropical regions, they are distinguished by their coarsely keeled scales and the divided anal shield. The British grass-snake (*N. natrix*) is a typical example. The name is not due to specially aquatic habits, but to the fact that these

snakes are found mostly near water, their food consisting of fishes, frogs, etc. See Snake.

Water Softening. Domestic water can be softened by adding borax or sodium carbonate, or mixtures of the two salts, with perfume. These chemicals precipitate the dissolved salts which cause the "hardness" of water, so that it produces a good lather with soap. The zeolite system, which removes all hardness, uses permutites or artificial zeolites. These are hydrated aluminosilicates of sodium, similar in composition to naturally occurring zeolites, e.g. analcite, $\text{Na}_2\text{O} \cdot \text{Al}_2\text{O}_3 \cdot 4\text{SiO}_2 \cdot 2\text{H}_2\text{O}$. Such materials remove hardness from water by an exchange between the bases present, usually by substituting sodium for calcium or magnesium.

Water Spider (*Argyroneta aquatica*). The only British aquatic spider, which lives below the surface in clear ponds. About $\frac{1}{2}$ in. long, the male is unusual in being larger than the female. Members of the two sexes make shelters of silk and plant material in which they live. They swim to the surface and take down bubbles of air attached to the end of their bodies; these bubbles they discharge into the shelter, where they are used for respiration. When swimming the body is coated with a large number of small bubbles of air which cling to its hairs and impart to it a silvery appearance. The spider carries living and dead insects to its shelter for consumption.

Waterspout. Term applied to the ocean counterpart of the tornado, of which it is usually a much less violent form. It occurs with heavy, thundery cumulonimbus clouds, from whose lower surface a small funnel-shaped cloud begins to descend slowly. Beneath this point the surface of the sea be-

comes disturbed and a cloud of spray forms. As soon as the spout dips into the spray, it assumes the appearance of a writhing, whirling column of water, generally between 20 and 30 ft., but sometimes as

much as 300 ft., in diam., and extending up to about 1,500 ft. in height. Waterspouts have been described as consisting of a hollow cylinder of water drops with a more or less transparent core, but a dark central core has also been observed, the whole strongly suggestive of spiral movements. The effects are purely local, the wind following a circular path around the vortex often being sufficiently strong to produce a rough sea. The duration is of the order of 10 mins. to half an hour, the waterspout breaking up at about one-third of its height from the base. Sometimes the phenomenon is not fully developed and the spout fails to reach the water surface; such pendants may also be seen during thundery weather over the land. Waterspouts occur most frequently in tropical waters in March, April, and Oct. In the North Sea six were reported by British observing ships during the 12 years 1920-31. One was seen off Beachy Head, Jan. 2, 1949. See Tornado.

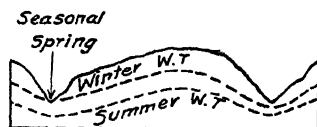
Water Supply. Term commonly used for the water supplied by a local authority for consumption within its area. Under the Rural Water Supplies Act, 1944, and the Water Act, 1945, the minister of Health became responsible for providing adequate water, and for conserving resources; and every local authority in Great Britain has the duty of ascertaining the sufficiency and wholesomeness of water supplies in its area. So far as practicable it must provide water, and pipes to carry it, in every part of the area in which there are houses or schools, to a point from which the water can be taken to the houses or schools at reasonable cost. When a new house is to be built, the local authority must see that under the plans the occupants are provided with a reasonable supply of wholesome water for domestic purposes either by connecting the house to the main supply or, if that is not reasonable, by taking water into the house in some other way or, if neither of these courses is practicable, by providing a supply of water within a reasonable distance of the house. If houses already occupied have no sufficient supply for domestic purposes, the local authority may, if this is reasonable, require the owner to connect the house by pipes to the main supply, or to provide a supply in some other way either in or near the house as may be reasonable.

Charges for water for domestic purposes are usually made by a

rate based on the value of the premises. When water supplied for domestic purposes is used for a garden or for horses or for washing vehicles, an additional charge may be made if a hosepipe or outside tap is used. Charges for water for domestic purposes may be made by meter instead of by a water rate; charges for water for industrial and business purposes are usually by meter.

Steps in the process of purification and distribution of water, and disposal of water sewage, are described under Filtration; Plumbing; Reservoir; Sewage.

Water Table. In geology, the surface below which the rocks of the earth's crust are saturated with



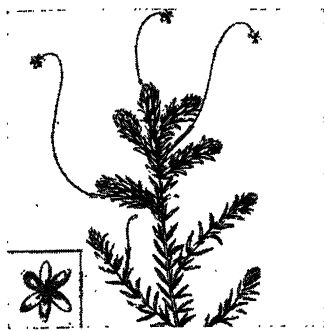
Water Table. Diagram showing the relationship between the water table and the ground surface in summer and in winter. With the rising of the water table in winter, a spring develops in the valley on the left

water. It is not a level surface, but it reflects the topography; it stands high below hills, and is at zero where it meets the sea. The position of the local water table is shown by the level of water standing in wells. This varies seasonally, according to the rainfall; it also changes slowly with climatic variations. After a wet period it rises and may even reach the ground surface in a valley or re-entrant. This gives rise to the flowing of an intermittent seasonal spring orbourne. In districts underlain by limestone, where water can flow easily down solution channels, pot-holes, and caverns, the water table tends to be at a great depth; but where the rocks are less permeable and the flow is restricted it is usually nearer the surface. In desert areas the depth may be very considerable, and because of this rivers flowing into deserts soak away and disappear. See Karst; Spring.

Water Thyme (*Elodea canadensis*). Perennial aquatic herb of the family Hydrocharitaceae. It is a native of N. America, but has become naturalised in Europe. It has slender, brittle, jointed stems, as much as four feet long, which root at the joints. The plant made its appearance in Ireland in 1836, and in England seven years later. It spread rapidly all over the country, and choked many canals and streams. Later it appeared to



Waterspout. A remarkable example in the Mediterranean, 1943



Water Thyme. Leaves and flowers of the plant introduced from N. America. Inset, flower

have lost much of its colonising vitality, and is almost extinct in many places where it was a pest.

Watertown. Town of Massachusetts, U.S.A., in Middlesex co. A suburb of Boston, from the centre of which city it lies 6 m. W., it stands on Charles river, and is served by the Boston and Maine rly. Rubber articles, hosiery, paper, motor vehicles, and stoves are among the chief manufactures. Watertown was settled about 1630. The provincial congress met here in 1775, when the town was second in size to Boston. Pop. 35,427.

Watertown. City of New York, U.S.A., the co. seat of Jefferson co. It stands on the Black river, 73 m. N. of Syracuse, and is served by the New York Central and Hudson River rly. Wood pulp and paper are manufactured. Watertown was incorporated in 1816, and became a city in 1869. The town was named because of its water power. Here in 1878 the first Woolworth store was opened. Pop. 33,385.

Watertown. City of Wisconsin, U.S.A., in Jefferson and Dodge cos. It stands on the Rock river, 45 m. W.N.W. of Milwaukee, and is served by the Chicago, Milwaukee, and St. Paul rly. The chief industries are the manufacture of cheese, boots, flour, cigars, and lumber products. Stuffed goose is a famous export. Watertown was settled in 1835, incorporated in 1849, and chartered as a city in 1853. Pop. 11,301.

Water Turbine. Machine for converting the potential energy of waterfalls into kinetic energy. There are two types, i.e. the Pelton wheel and the Francis turbine, respectively for high, and for medium and low falls. In the Pelton wheel the supply water issues at high velocity from a nozzle which directs it on to a series of cup-shaped buckets surrounding the wheel. The impulse of the jet pro-

vides the driving force on these buckets. Speed is regulated by increasing or diminishing the area of the nozzle to suit an increased or diminished demand for power. Such wheels are capable of giving an efficiency of over 80 p.c. They can be adapted to any head of water exceeding about 100 ft., and for powers, for high heads, up to about 20,000 h.p. The maximum feasible size of jet is about nine inches in diameter, and where this is insufficient to give the required power a second jet may be arranged to play on the wheel at a point about 90° from the first jet. This method is, however, not altogether advisable, as there is some interference between the jets which reduces the efficiency.

Where, owing to the smallness of the head or the large power desired, the volume of water to be handled is very large, the Pelton wheel with its single or double jets becomes unsuitable, and for such cases the Francis turbine is used. This turbine consists of a wheel or runner carrying a series of curved vanes or buckets around its periphery. Water is supplied to the runner through a series of guide vanes or buckets entirely surrounding the runner and thus giving a large area of waterway. The guide vanes are so arranged as to direct the water almost tangentially into the vanes of the runner, and these latter are so shaped as to receive the water without shock, and to discharge it axially into the discharge pipe or draught tube. Under favourable conditions the efficiency of this type of turbine may exceed 90 p.c. It is adaptable to any head from about 400 ft. to as low as 1 foot. Most of the largest turbines as yet built are of this type, and will develop as much as 115,000 h.p. under a head of 400–500 ft.

Speed regulation is attained by the use of movable guide vanes. Each vane is pivoted about an axis near its centre, and all the vanes are operated by a common ring whose position is regulated by the governor. The movement of this ring varies the area of the waterway between the vanes.

Waterville. City of Maine, U.S.A., in Kennebec co. It stands on the Kennebec river, 80 m. N.N.E. of Portland, and is served by the Maine Central rly. Cotton and woollen goods are the leading manufactured products. Waterville was incorporated in 1802, and became a city in 1883. Pop. 16,688. Waterville is also the name of a watering-place in Kerry, Eire.

Water Violet (*Hottonia palustris*). Perennial aquatic herb of the family Primulaceae. It is a native of Europe and W. Siberia. It is a floating plant, the thick succulent branches rooting on the surface. The erect flower-stem stands out of



Water Violet. Flowers and leaves of the floating plant. Inset, flower

the water to a height of a foot or more, bearing the lilac, salver-shaped flowers.

Watervliet. City of New York, U.S.A., in Albany co. It stands on the left bank of the Hudson river, opposite Troy, which is reached by ferry and bridge, and is served by the Delaware and Hudson rly. The oldest U.S. arsenal (built 1807) is here, ironically, built on the site of the first settlement of the pacifist Shaker cult. The early settlement was called West Troy; it was incorporated as a village in 1836, and became a city in 1897. Pop. 16,114.

Water Vole (*Arvicola amphibius*). Species of vole, popularly known as the water rat. See Vole.

Waterways. Term sometimes applied to a system of artificially constructed navigable channels, usually linking up navigable rivers. See Canals.

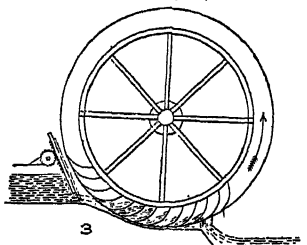
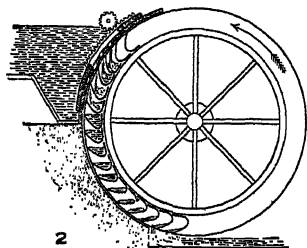
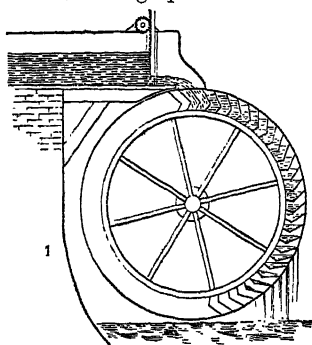
Water Wheel. Wide, horizontal wheel turned by water caught in vanes parallel to the axis. Water wheels are the oldest means of utilising water power, and some are highly efficient.

The overshot wheel (Fig. 1, see next page) receives the water at the top at a velocity about half as great again as that of the wheel. The water acts by gravity.

Water enters a breast wheel (Fig. 2) below the top, and turns it by weight entirely if caught in buckets, or partly by its velocity if vanes are used. The breast fits the wheel as closely as possible to minimise waste of water.

The undershot wheel (Fig. 3) receives water at the bottom, and makes use of its momentum. In the Poncelet wheel the vanes are so

shaped that the water enters them tangentially, and comes to rest while travelling upwards over the



Water Wheel. Principal types in common use. 1. Overshot. 2. Breast. 3. Undershot. See text

faces. The spaces between the vanes are only partly filled, as the water issues from the gate in the form of a sheet considerably thinner than the pitch of the vanes. See Water Turbine.

Watford. Mun. borough and market town of Herts, England. It stands in the valley of the Colne, and has three rly. stations, the junction and one in High Street which are served also by the Bakerloo rly., and Watford West. There is communication with adjoining districts by bus and Green Line. The chief building is the Perpendicular church of S. Mary, restored 1870-71; it has two chapels and interesting monuments. Other buildings include the London Orphan Asylum, Salters' almshouses, and schools. Part of Cassiobury Park, formerly the seat of the earl of Essex, is now the property of the town. Many

industries have been established at Watford during the 20th century, such as printing works and factories for preparing food-stuffs. Brewing and milling are older industries. Watford, made a borough in 1922, elects an M.P. Market day, Tues. Pop. 67,070.

Wath-upon-Deerne OR

DEARNE. Urban dist. and market town of Yorks (W.R.), England. It is 6 m. by rly. N. of Rotherham and near the Dearne and Dove canal. Iron and coal are mined. Market day, Sat. Pop. 23,000.

Watkin, Sir Edward William (1819-1901). A British railway director. Born in Manchester, Sept. 26, 1819, he became secretary of the Trent Valley rly. in 1845, and was next employed by the Manchester and Sheffield Co., of which he was chairman by 1864. He was also chairman of the South-Eastern and Metropolitan rlys. for many years. Watkin's most successful work was the conversion of the Manchester, Sheffield, and Lincoln into a great trunk line, the Great Central. Projects for channel tunnels to connect France with England, and to link Scotland with Ireland, occupied his attention, and he began the Watkin tower, modelled on the Eiffel tower, at Wembley. Liberal M.P. for Stockport, 1864-68, and for Hythe, 1874-95, Watkin was knighted 1868, and a baronet from 1880. He died April 13, 1901.

Watkins, Hubert George (1907-32). An English explorer. Educated at Lancing and Trinity College, Cambridge, he was chosen in 1927 to lead the university expedition to Spitsbergen, in which, and in an expedition organized by himself to Labrador next year, he proved a born leader of men. He led the British Arctic air route expedition of 1930 to Greenland, accomplishing valuable pioneer work, and receiving the founders' medal of the Royal Geographical Society. Returning to Greenland in 1932, he was accidentally drowned, Aug. 20. *Consult* Watkins's Last Expedition, F. S. Chapman, 1934; Gino Watkins, J. M. Scott, 1935.

Watling or Watling's Island. Alternative name for a small British island in the Bahamas,



Watford, Hertfordshire. The town hall, opened in January, 1940

West Indies, now believed to be the first landing-place of Columbus in 1492, and renamed San Salvador (formerly applied to Cat Island).

Watling Street. Early English name for a Roman road from Dover to Wroxeter. Utilising an older British track along the watersheds, it was a reconstruction on Roman lines, as shown by its 11 straight sections with angular junctions. It ran through Canterbury, London, St. Albans, Dunstable, and Towcester to Wroxeter. See Britain.

Watson, Sir Alfred Henry (b. 1874). British journalist. He was born at Newcastle-on-Tyne, becoming a journalist at 16. In 1894 he was leader-writer to the Newcastle Leader, joining the Westminster Gazette in 1902 and becoming managing editor in 1921. During 1925-33 he was editor of the Statesman, Calcutta. He was knighted 1932. At home he was from 1940 a director of the periodical Great Britain and the East. He wrote for this Encyclopedia the article on modern India. His brother, Arthur E. Watson (b. 1880), was managing editor of the Daily Telegraph, 1924-50.

Watson, Sir Angus (b. 1874). British business man. He was born at Ryton-on-Tyne, Jan. 15, 1874, and educated privately. He founded the fish business of Angus Watson and co., Ltd., which eventually had branches in many countries and a capital of



Sir Angus Watson, British business man

£2,000,000. He also started a large fish-canning firm in Norway. He was president of the Tyneside council of social service, which did great work in alleviating unemployment distress in the Tyneside area during the 1930s. A

prominent Nonconformist, he contributed articles to the religious press. Watson was knighted in 1945. He published an Autobiography in 1937.

Watson, Sir Bertrand (1878-1948). British magistrate. He was born at Stockton, May 16, 1878, educated at Harrogate, and admitted solicitor in 1900. Nine years as deputy-coroner for Durham was followed by a spell on its council, 1912-19, and he was Liberal M.P. for his native town, 1917-23. From 1928 he was a metropolitan police magistrate, at N. London, Clerkenwell, and Lambeth courts, almost continually until 1941, when he was raised to the chief magistracy in succession to Dummett at Bow Street. Sir Bertrand, who was knighted in 1942, died Feb. 16, 1948.

Watson, Dr. John. The supposed narrator of all but three of the 60 Sherlock Holmes stories by Sir A. Conan Doyle. A former army doctor, wounded in Afghanistan, he is closely associated with Holmes in all the adventures, and in the earlier stories shares with the great detective the famous Baker Street apartments. The rock-like normality of his mind and temperament serves as a constant foil to Holmes's brilliant genius, and more than once his stolid common sense is made to look like stupidity; yet a genuine affection is shown to exist between the two, Holmes once having declared: "I should be lost without my Boswell." Most readers, too, acquire a peculiar fondness for Watson, and such details of his life apart from Holmes as can be deduced from references in the various stories have aroused the interest of the curious. He marries the heroine of *The Sign of Four*, but is later presented as a widower, and finally as remarried. See Holmes, Sherlock; consult Dr. Watson, S. C. Roberts, 1931.

Watson, John. Scottish novelist and divine who wrote under the pseudonym of Ian Maclaren (*q.v.*).

Watson, John Christian (1867-1941). Australian statesman. Born at Valparaiso, April 9, 1867, of Scottish parentage, he was taken to New Zealand, receiving his education at the public school of Oamaru. He went to Sydney and became a compositor, then took up politics, being chosen president of the Sydney trades and labour council. He was member of the N.S.W. legislative assembly, 1894-1901, becoming leader of the Labour party, and sat in the Com-

monwealth parliament 1901-10. In 1904 he was the first Labour prime minister of the Commonwealth of Australia. He died Nov. 18, 1941.

Watson, Robert (1746-1838). Scottish adventurer. Born at Elgin, Jan. 29, 1746, he fought under Washington in the American War of Independence, and after his return to England became secretary to Lord George Gordon (*q.v.*), whose life he wrote in 1795, and an irrepressible agitator. Watson was imprisoned in 1796 for conspiracy, wandered to Paris in 1798, became intimate with Napoleon, to whom he gave lessons in English, and was made principal of the Scots College in Paris. Later he settled in Rome, where in 1817 he made £3,600 by trafficking in Jacobite papers which he had bought for a few shillings. Eight years later he returned to London, where he committed suicide, Nov. 19, 1838.

Watson, Sir (John) William (1858-1935). English poet, born Aug. 2, 1858, at Burley-in-Wharfedale. While still at a Southport school he wrote much verse, and in 1880 published *The Prince's Guest*, but left all these poems out of his collected edition of 1928. By 1892 Words-



Sir William Watson,
British poet
Russell

worth's *Grave*, and a fine ode on Tennyson's death, *Lachrymae Musarum*, made Watson talked of as a likely poet laureate; but his lifelong opposition, already expressed, to imperialism, whether in Ireland or in the East, was no doubt a disqualification. Watson coined the name of Abdul the Damned in verses on the Turkish sultan's massacres of Armenians. One year, 1896, brought forth *The Purple East*, and *The Year of Shame*. Another splendid ode was written for Edward VII's coronation. Influenced chiefly by Wordsworth and Arnold, Watson had the gift of sonorous blank verse. His best-remembered short pieces include *The Great Misgiving*; the sonnets *Estrangement*, and *Voice and Vision*; April, April; Ode in May. "The last of the



Robert Watson,
Scottish adventurer
After M. Vogelstein

Victorians," who was knighted in 1917, died Aug. 11, 1935.

Watsonia. Genus of bulbous herbs, also known as Bugle Lily (*q.v.*).

Watson's Bay. Seaside resort on Sydney Harbour, New South Wales, Australia. It is 4 m. E. of the city, inside South Head, which has a powerful lighthouse and is fortified. Pop. est. 1,600.

Watson-Watt, Sir Robert Alexander (b. 1892). British inventor. He was born April 13, 1892, and educated at Brechin high school, Dundee university college, and St. Andrews university. After serving in the meteorological office and the department of scientific and industrial research, he was during 1933-36 head of the radio department of the national physical laboratory. In 1935 he first suggested the possibility of radar (*q.v.*) as a means of detecting distant aircraft, and before the Second Great War was director of communications development at the Air ministry, later transferring to the ministry of Aircraft Production. He continued to advise on telecommunication to the Air ministry, and was knighted in 1942 for his work in all these spheres. After the war he turned his attention to the problems of television in cinemas, forming the firm of Sir Robert Watson-Watt and Partners, Ltd., to carry on experimental work in this and cognate matters.

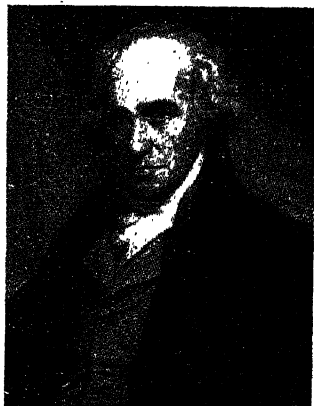


Sir Robert
Watson-Watt,
British inventor

Watt. Unit of electrical power. It is the energy expended per sec. between two points in a circuit which differ by one volt when a current of one ampere flows, *i.e.* watts = amperes \times volts. One horse-power is 746 watts. For convenience, large amounts of power are rated in kilowatts (one thousand watts) and megawatts (one million watts), and very small amounts in milliwatts (one-thousandth watt) and microwatts (one-millionth watt). The watt-hour, a power of one watt for one hour, is a measure of electrical energy, and one kilowatt-hour is the standard board of trade unit by which electricity is sold. Wattless current is that part of the current in an A.C. circuit which may be regarded as being 90° out of phase with the circuit voltage, and does not, therefore, contribute

to the total power in the circuit (see Power Factor). A pure inductance which contained no resistance would draw a completely wattless current. Actually, since resistance cannot be escaped, there will be a small power component of the current due to resistance losses. Since even wattless current loads up a conductor, it is customary to rate apparatus such as transformers not in kilowatts but in kilovolt-amperes.

Watt, JAMES (1736-1819). Scottish engineer. Born at Greenock, Jan. 19, 1736, a merchant's son,



After Str W. Beechey *James Watt*

he was extremely delicate in youth. He learnt the use of wood and metal working tools, studied mathematics, and at eighteen went to London as assistant to an instrument maker. Ill-health compelled a return to Glasgow. In 1764, when maker of mathematical instruments to Glasgow university, he repaired a model of the Newcomen steam engine, and turned his attention to avoiding the waste of steam in such engines. Next year he patented the epoch-making method of external condensation of the steam away from the cylinder. Watt met his future partner, Matthew Boulton, in 1768, and in 1774 an experimental engine was completed embodying the essential features of the modern steam engine. To Watt was due the contrivance of sun and planet gear wheels for changing reciprocating into rotary motion; the well-known centrifugal governor as applied to the steam engine; the water gauge, and the incorporation of the principle of parallel motion, one of the most useful of all.

Watt had a remarkably prolific mind, though in many respects an

extremely limited one; he laughed at the idea of a steam locomotive, and scoffed at Trevithick (*q.v.*). Yet to Watt we owe the invention of duplicating letters by specially prepared ink; the discovery of the composition of water; the invention of a micrometer and the hydrometer for quickly ascertaining the specific gravity of liquids; the marine screw propeller, etc. He was a fellow of the Royal Society and that of Edinburgh, and one of the eight foreign members of the Institute of France. In 1800 he retired to his estate at Heathfield Hall, Birmingham. He died Aug. 25, 1819. See Parallel; Steam Engine.

Bibliography. Origin and Progress of the Mechanical Inventions of James Watt, J. P. Muirhead, 1854; Life of Watt, J. P. Muirhead, 1858; Lives of Boulton and Watt, S. Smiles, 1865; James Watt, T. H. Marshall, 1925; J. W. and the Steam Engine, H. W. Dickinson and R. Jenkins, 1927.

Watteau, JEAN ANTOINE (1684-1721). French painter. The son of a plumber, born at Valenciennes, Oct. 10, 1684, he studied under a local teacher and then made his way to Paris, where he entered the studio of Gillot, a decorative painter. While thus employed, he was thrown much into the society of theatrical people. He left Gillot to become assistant to Audran, keeper of the Luxembourg, where he studied the old masters. After a brief visit to Valenciennes, he set up for himself in Paris, under the patronage of the marquis of Tugny, then the chief collector of pictures. Watteau came second in the competition for the prix de Rome, 1709, and became an asso-

ciate member of the Academy, 1712. For Tugny, with whom he lived,



J. Antoine Watteau,
French painter

he painted *The Seasons*, *Les Charmes de la Vie*, *Les Noces*, and the celebrated *Conversations*, based on scenes noted in the Luxembourg gardens, and many *fêtes galantes*. He was made full member of the Academy, 1717, his diploma picture being the famous *Embarkation for Cythera*, now in the Louvre. Recognition came too late, for he was already suffering severely from consumption. In 1719 he visited England for medical advice, painting for his doctor *Les Comédiens Italiens* and *L'Amour Paisible*. On July 18, 1721, he died.

Watteau opened a new period in French art. Following his leadership came Lancret, Boucher, and Fragonard. His work, delicate and poetic, represented a reaction against the classical style. He introduced new scenes and new figures: the clown, the Italian singer and guitar-player; beautiful ladies and elegant gentlemen hunting and picnicking; and soldiers on the march. His *fêtes champêtres* began a vogue which has never entirely died out; but his representations of country lovers, shepherds, and yokels showed equal skill and sympathy. As a technician he is a forerunner of the Impressionists in his treatment of light and colour. In the Wallace Collection, London, he is



Jean Antoine Watteau. *The Music Party*, a characteristic group of courtiers, placed in a landscape typical of the artist's style

well represented. The championship of E. de Goncourt restored him to favour about 1875. The best Life in English is by C. Phillips, 1895.

Watterson, HENRY (1840-1921). American journalist. He was born Feb. 16, 1840, at Washington, where his father was a member of congress. After an informal schooling he became a reporter. On the outbreak of the Civil War he served in the Confederate army. In 1868, when two journals were consolidated in the Louisville Courier-Journal, Watterson was appointed first editor, and until his retirement in 1918 he exerted through its columns a powerful influence on politics, a series of attacks on The Man on Horseback (Theodore Roosevelt) attracting wide attention. In 1918 he was awarded a Pulitzer prize for editorials acclaiming America's declaration of war. Marse Henry, his autobiography, appeared in 1919. He died Dec. 22, 1921.

Wattignies, BATTLE OF. Victory won by the French Revolutionary armies under Carnot and Jourdan against the Allies, principally Austrians, under Coburg, Oct. 16, 1793. Wattignies is a hamlet in Nord dept. of France, 5½ m. S.S.E. of the fortress of Maubeuge, which was being besieged. The French were 43,000 against 23,000. Their premature attack on the 15th was beaten off, but in the night Carnot moved 8,000 troops across to his right against Wattignies, where the heights were insufficiently defended. In the forenoon this place was taken by the French, who held it just long enough for victory to be achieved on the central plateau. Coburg retreated across the Sambre in good order, having lost 2,500, his assailants rather more. On this battlefield, declares Hilaire Belloc, "more was done to affect both military and general history than on any other"; for the fall of Maubeuge might have entailed that of Paris, and Wattignies witnessed the beginning of new tactics devised by Carnot and later perfected by Napoleon.

Wattle (A.S. *watel*, twig). Term used in architecture to denote one of the earliest materials employed in erecting human dwellings. In its most primitive form the wattle occurs as a leafy wind-screen, as in aboriginal Australia and Tierra del Fuego. In Neolithic Europe huts of interlaced osiers were clay-daubed or turfed, and in Swiss lake-dwellings burned wattle-and-

daub fragments have been preserved. Similar structural methods occurred in oldest Crete, Mesopotamia, and Vedic India; they survive in Africa, especially among the Nilotic peoples. Wattle-and-daub survived throughout Roman Britain, as at Silchester, into Anglo-Saxon England. See Africa.

Wattle. Name applied to various Australian species of acacia (*q.v.*). Wattle day is the name given to the day (Jan. 26) on which Sydney was founded in 1788. It is kept as an anniversary.

Wattle Bird (*Anthochaera carunculata*). Species of honey eater, found only in Australasia. These



Wattle Bird. The Australasian honey eater

birds are notable for their long tongue, which resembles a brush at the tip, and is used for extracting nectar from flowers. The large wattles, depending from the side of the head, give the species its name.

Wattmeter. Instrument for measuring electrical power. It consists essentially of a fixed rectangular flat coil through which the main current passes; a movable coil within the fixed one, with a shunt connexion to the fixed coil circuit; a resistance inserted in series with the movable coil; and a spiral spring and a silk thread by which the movable coil is suspended, and a dial indicator. When the wattmeter is suitably connected into the electrical circuit under test the current in the fixed coil will be that flowing in the test circuit, while the current in the high resistance movable coil will be a measure of the electrical potential difference across the circuit. Since the force between the coils will be proportional to the product of the currents in them, it follows that the rotation of the suspended coil will be a measure of the electrical power developed in the circuit. This

movement is indicated by a hand or pointer on a dial or scale.

Watts, GEORGE FREDERIC (1817-1904). British painter. He was born in London, Feb. 23, 1817, of a Herefordshire family, and in 1835 entered the R.A. schools. He also frequented the studio of Behnes the sculptor, from whom he obtained ideas concerning the nobility of Greek art. At the very outset of his career he painted good portraits, two of which were exhibited at the R.A. in 1837, together with a picture called The Wounded Heron. His portrait of Mrs. Ionides, exhibited 1840, drew public notice to his work.

Gaining a premium shortly afterwards for a cartoon for the decoration of the palace of Westminster, he went to Italy in 1844 and remained until 1847, employing himself in painting portraits of the English who passed through Florence. From 1848 he became one of the best-known portrait painters in England. After about ten years of hard work, he developed a patriotic desire to paint the portraits of leaders of the intellectual movement in England, and eventually to present them to the nation. He made over the first of these gifts in 1883, and continued to make additions to his gallery until his death, enriching the National Portrait Gallery with a series representing Manning, J. S. Mill, Lord John Russell, Tennyson, Browning, Carlyle, Gladstone, Max Müller, Morris, Rossetti, and many others.



q.v. note

Towards the middle of his life, he began the creation of an extraordinary series of symbolic pictures, e.g. Time, Death, and Judgement; Love and Life; Mammon; Love and Death; Faith; Hope; to these he devoted an enormous amount of attention, intending

that most should remain in the possession of the nation, and set forth his ideas of religion to those who followed. He also attained eminence as a sculptor, and his colossal group called *Physical Energy* was adopted as a fitting memorial of Rhodes, for erection on his grave in S. Africa. A replica of it stands in Kensington Gardens.

Striking as Watts's symbolic paintings are, it is by his great portraits that he is more likely to live, for his emblematic pictures are difficult of comprehension. They are, however, examples of mastery of material and technique. In 1891 he built himself a country house at Compton, Surrey, which he named *Limnerslease*, and designed and carried out for the parish a wonderful cemetery chapel, which sets forth, in strange imagery, his ideas respecting life and death. Close to his house



George Frederick Watts. His picture *Love and Death*, now in the Tate Gallery, London

stands a picture gallery, founded by his wife, and containing some of his greatest works. The O.M. was conferred upon Watts at its inception in 1902, and although he declined other honours, he was regarded during later life as the chief of English artists. He died at Compton, July 1, 1904. He was twice married, first to Ellen Terry,

from whom he afterwards separated, and then to Miss Fraser-Tytler, whom he married in 1886, and who survived him. See Arnold, M.; Browning, R.

Bibliography: Lives, J. Cartwright, 1896; Mrs. Russell Barrington, 1906; J. E. Phythian, 1906; G. K. Chesterton, 1909; M. S. Watts, 3 vols., 1912; E. R. Dibdin, 1923; E. H. Short, 1925; *The Laurel and the Thorn*, R. Chapman, 1945.

Watts, ISAAC (1674-1748). An English divine and hymn writer. He was born at Southampton

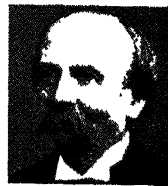
(where Watts's Park, with statue, commemorates him) and attended an academy for dissenters at Stoke Newington. In 1697 he was chosen assistant pastor of an Independent church in Mark Lane, succeeding to full charge in 1702. For 36 years he resided with the Abney family at Theobalds and Stoke Newington, dying Nov. 25, 1748. Watts was a noted preacher, a writer on logic, and is represented in the Oxford Book of English Verse, but his fame rests on hymns, and to a lesser extent on *Divine and Moral Songs*, for children, 1713. He wrote (among some 600 hymns) *Our God, our help in ages past; When I survey the wondrous Cross; There is a land of pure delight; Come, let us join our cheerful songs; Jesus shall reign*. In work of the second category Watts achieved household words with *How doth the little busy bee; Let dogs delight to bark and bite; 'Tis the voice of the sluggard; which all proved gifts to parodists*. See *Hymns*. Consult Lives, E. P. Hood, 1875; A. P. Davis, 1948; *The Hymns of Wesley and Watts*, B. Manning, 1932.

Watts, WILLIAM WHITEHEAD (1860-1947). English geologist. Born at Broseley, Shropshire, he went to Denstone school and Sidney Sussex College, Cambridge. A university extension lecturer during 1882-91, he next joined the staff of the geological survey. Assistant professor of geology at Birmingham from 1897, he transferred to the chair in that subject at the Royal (later Imperial) College of Science, retiring 1930. F.R.S. in 1904, and president of the British Association in 1935, Watts wrote copiously on geology, and did much original work on the ancient rocks of the Midlands. He died July 30, 1947.



J. Watts.

Watts-Dunton, WALTER THEODORE (1832-1914). British critic and poet. Born Oct. 12, 1832, at St. Ives, Hunts, he was educated privately and became a solicitor. In London he abandoned that profession for literary work



Walter Watts-Dunton

and made the acquaintance of Rossetti, Morris, and Swinburne. Another intimate friend was Borrow, like whom he had wandered and learned a good deal about gipsy life, and whose *Lavengro* and *Romany Rye* he edited. The bulk of Watts-Dunton's writings appeared in *The Examiner* and *The Athenaeum*, and secured his reputation as the leading literary critic of the time, whose criticisms of poetry especially were marked by deep insight. His first published book was a volume of poems, *The Coming of Love*, 1897, characterised by the exquisite technical perfection that marked all his work. In 1898 appeared *Aylwin*, a long prose romance of Romany life. His other works include *The Renaissance of Wonder*, 1903; *Studies of Shakespeare*, 1910; and the posthumous *Old Familiar Faces*, 1916. He died June 6, 1914. In later years he added his mother's maiden name of Dunton to his own. He reformed Swinburne and for 30 years looked after him in his house at Putney. See Swinburne. Consult Lives, James Douglas, 1904; T. Hake and A. Compton-Rickett, 1916.

Watusi or **BATUŚI**. Pastoral people, partly in Ruanda, Belgian Congo, and partly in the adjacent portions of Tanganyika Territory. Of Bantu speech, they are the southernmost offshoot of the Uganda Bahima, but their Hamitic blood has been mingled with negroid elements by contact with the Bahutu and cognate aboriginal tribes. Of aristocratic mien and temperament, they wear loosely draped cotton kangas, with heavy ornaments of metal wire, occupy beehive huts of grass, and procure their ironwork and vegetable produce from the subject Bahutu.

Wauchope, SIR ARTHUR GREENFELL (1874-1947). British soldier and administrator. Son of an Edinburgh citizen, he was born March 1, 1874, and educated at St. Ninian's and Repton. Joining the

Black Watch at 22, he fought in the S. African War under his relative, Gen. A. G. Wauchope, who was killed leading the Highland brigade at Magersfontein. The First Great War took him to the battle of Loos and through the Mesopotamian campaign. Wauchope then constituted himself the historian of the Black Watch. He had a brigade in Silesia, 1921-22, and was promoted major-general in 1923. Next year he was British chief on the Allied control commission in Berlin. In 1929 he received the N. Ireland command. Knighted in 1931, Lieut.-Gen. Wauchope was sent out as high commissioner and c.-in.-c. for Palestine and high commissioner for Transjordan, which he controlled until ill-health caused his retirement in 1938. He died Sept. 14, 1947. *Pron.* Waukup.

Waugh. Name of a British family of distinction in the literary world. Arthur Waugh (1866-1943), publisher and *littérateur*, who was born Aug. 24, 1866, and educated at Sherborne and New College, Oxford, gained the Newdigate prize for a poem, *Gordon in Africa*. He began his career as a critic and editor, then joined the firm of Chapman and Hall, of which he was managing director 1902-30, chairman 1926-36. He edited Johnson's *Lives of the Poets*, 1896, and the Biographical edition of Dickens's works, 1902-03. In 1930 he published *A Hundred Years of Publishing*, to celebrate the centenary of his firm. He died June 26, 1943.

His elder son Alexander Raban (Alec Waugh) was born at Hampstead, July 8, 1898, educated at

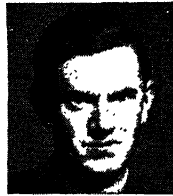


Alec Waugh,
British author

life, and followed it with many novels of varying popularity and merit, e.g. *Clouded Summer*, 1949. During the 1920s and '30s he travelled extensively, and *The Coloured Countries*, about the South Seas, appeared in 1930. His travel sketches in *The Sunlit Caribbean*, 1948, gave a vivid picture of life in the W. Indies.

The second son, Evelyn Arthur St. John (b. 1903), was educated

at Lancing and Hertford College, Oxford. After writing a study of Rossetti, he published *Decline and*



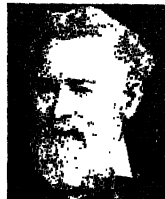
Evelyn Waugh,
British author

Fall, 1928, and with *Vile Bodies*, 1930, he achieved a public for his satires on society and contemporary manners. Later novels were *Black Mischief*, 1932; *Handful of*

Dust, 1934; *Put Out More Flags*, 1942. In *Brideshead Revisited*, 1945, he displayed emotional power and psychological insight. The *Loved One*, 1948, satirised embalming at Hollywood. A serious study of Edmund Campion, 1935, was awarded the Hawthornden prize.

Waugh, BENJAMIN (1839-1908). British philanthropist. Born at Settle, Yorks, Feb. 20, 1839, and educated at Airedale College, Bradford, he was a Congregational minister at Newbury and Greenwich, 1865-87, and edited *The Sunday Magazine*, 1874-96. Having helped Hesba Stretton (*q.v.*) to found the London Society for the Prevention of Cruelty to Children, 1884, he established it on a national basis. He died March 11, 1908. *Consult* Life, Rosa Waugh, 1913; Centenary Memoir, R. Hobhouse, 1939.

Waugh, EDWIN (1817-90). An English poet. Born at Rochdale, Jan. 29, 1817, son of a shoemaker, he received little education except what he could pick up for himself while employed by a local bookseller and printer. His first sketches of Lancashire life attracted the notice of Carlyle. Even greater success awaited his first lyric, *Come whoam to the childer an' me*. This was followed by a long succession of poems and sketches in the broad dialect of his native county that earned for their author the title of the Lancashire Burns. He died April 30, 1890.



Edwin Waugh,
Lancashire poet

Waukegan. City of Illinois, U.S.A., the co. seat of Lake co. It stands on the W. side of Lake Michigan, 36 m. N. of Chicago, and is served by the Chicago and North-Western rly. It has a good harbour and is visited as a health and bathing resort. Pop. 34,499.

Waukesha. City of Wisconsin, U.S.A., the co. seat of Waukesha co. It stands on the Little Fox river, 18 m. W. of Milwaukee, and is served by the Chicago, Milwaukee, and St. Paul and other rlys. Settled in 1834, Waukesha was incorporated in 1852, and became a city in 1896. It has mineral springs and is favoured as a health resort. Iron and steel working, manufacture of agricultural implements, and preparing mineral waters are the chief industries. Pop. 17,176.

Wausau. City of Wisconsin, U.S.A., the co. seat of Marathon co. It stands on the Wisconsin river, 180 m. N.W. of Milwaukee, and is served by the Chicago, Milwaukee, and St. Paul rly. The Big Bull Falls provide water power. Papermaking is the chief industry. Settled in 1838, Wausau was incorporated in 1853, and became a city in 1880. Pop. 23,758.

Wave. Type of vibrational disturbance in an elastic medium. Wave motion may exist in any solids, liquids, gas, or ether. The most familiar kind of waves are those of the sea. In such waves the water moves up and down and lightly backwards and forwards, though the effect of the wave motion is to give an impression that the water itself is moving forward. *See* Wave Motion.

Wave Action. Sea waves are powerful agents of erosion, transportation, and construction. Short choppy waves which break steeply on to the shore tend to comb it down and wash the detritus away to sea; but slower waves with greater distances between crests have a powerful forward movement and sweep material up the beach, so tending to build the land seawards. Wave action on a steep shore or cliff is predominantly destructive. The plunge of the breaker compresses air in the crevices and joints of the rocks so that fragments are loosened or forced out as the wave recedes. Loose rocks are picked up by the waves and hurled back against the cliffs so that both are battered. Thus cliffs are undercut between high and low tide levels and broken down and eroded.

Soft beds of rock, lines of joints, or fissures are picked out by wave action so that narrow chasms, inlets, blow-holes, and caves are carved out. Sea stacks or rock pinnacles are left standing where the waves have followed lines of weakness and so cut through behind a more resistant rock-mass. Greater alteration to a coastline may be accomplished

in one big storm than by the prolonged action of weaker waves. The most powerful storm waves are produced by winds travelling over the longest stretches of open water, i.e. having the longest "fetch." Wave action is not confined to the zone of breakers, but extends to depths equal to the distance between successive waves. See Coast; Tsunamis.

Wavelength. The distance from crest to crest or from trough to trough of two adjacent waves. See Ray; Wave Motion.

Wavell, ARCHIBALD PERCIVAL WAVELL, 1ST EARL (1883-1950). British soldier. Born May 5, 1883, he was educated at Winchester and Sandhurst and commissioned in the Black Watch in 1901. He served in the S. African War, and on the N.W. frontier of India. In the First Great War he was in France until 1915, when he was wounded and lost the sight of an eye. After his recovery he was with the home forces, and then, 1916, British military attaché to the Russian army in the Caucasus. He became liaison officer between the war office and the Egyptian expeditionary force, and in 1918 brig.-gen. on the B.E.F. general staff.

Promoted maj.-gen. 1933, Wavell commanded the British in Palestine during the Arab revolt of 1937-38. Then he was promoted lieutenant.-gen. and given the southern command. In July, 1939, he was appointed c.-in-c. Middle East (h.q. at Cairo). When, in May, 1940, it seemed likely that Italy would enter the Second Great War, Wavell, promoted full general, moved the British and Egyptian troops to war stations, and quickly built up a small and efficient army of Imperial troops.

With troops in the Middle East totalling 86,000 he swept the Italians out of Cyrenaica, 1940-41, and took 120,000 prisoners in one of the most rapid advances in history. He conducted with equal success the operations in British Somaliland, Italian Somaliland, Eritrea, and Abyssinia, all in 1941. At no time did his army in the field exceed 12 divs., of which only two were armoured, and it was much below establishment in vehicles, yet it defeated well-equipped Italian armies totalling more than 400,000.

The German invasion of the Balkans obliged the British govt. to fulfil its promise of aid to Greece. Wavell had to transfer a large part of his army there, while reinforcements destined for him were

diverted to the new theatre. Wavell was ordered to form a defence line with his remaining troops and undertake no operations beyond the W. frontier of Cyrenaica. With the landing in N. Africa of German forces under Rommel, his army was forced to retreat. In spite of what he had achieved against the Italians, Wavell was officially held responsible for Rommel's success, and was relieved of his command on July 1.

Dispatched immediately to India as commander of British forces there, Wavell found this office one of great responsibility, not only in India itself, but westward to reinforce the 10th army in Persia and Iraq, and eastward to meet the



1st Earl Wavell, British soldier

threat from Japan. At an Allied conference at Chungking on Dec. 23, following the entry of Japan into the war, Burma was added to the same command. In Jan., 1942, Wavell was appointed supreme commander in the S.W. Pacific area. The command was abolished on March 2, with the end of effective Allied control in that area, and Wavell reverted to his post as c.-in-c. India, and was appointed to the viceroy's executive council. He assisted Sir S. Cripps in the negotiations with the Indian Nationalist parties, and won the confidence of Indian leaders. On June 19, 1943, he was simultaneously promoted field marshal and appointed, in succession to Lord Linlithgow, viceroy of India, the second professional soldier to hold that office; and on July 23 was created Viscount Wavell of Cyrenaica and of Winchester. He took office at a critical period. In the N.E. the Japanese were at the frontier; Bengal was in the grip of famine; and the Indian people, anxious for independence, were unable to agree on the structure of the future Indian

state. The new viceroy tackled the problems with energy; within four days of installation he was in Calcutta and personally supervised the famine relief measures. Then followed a tour of all India in an attempt to enlist the cooperation of the provincial govts. Whilst sympathising with India's claim to independence within the Commonwealth, Wavell was opposed to partition, believing that it would weaken the sub-continent's ability to defend itself. He convened the Simla conference of 1945 and later attended the London parleys on Indian independence. With the acceptance of the policy of partition, he resigned the viceroyalty, in Feb., 1947, and was created an earl the following May. Made constable of the Tower of London, 1948, he died May 24, 1950. His body was carried by river from the Tower to Westminster Abbey, June 7, and was buried at Winchester College.

Wavell earned distinction as an author. His books include *The Palestine Campaigns*, 1928; *Generals and Generalship*, 1941; *Studies of Allenby*, 1940 and 1943; *Speaking Generally*, 1946; *The Good Soldier*, 1948. *Other Men's Flowers*, 1944, is a verse anthology; Wavell was vice-president of the Poetry Society.

Essentially an opportunist in tactics, Wavell was one of the few British commanders who fully appreciated at the start that the Second Great War would be one of movement and not a repetition of the static conflict of 1914-18. His victories were due to his policy of striking successive blows at the enemy, abandoning the recognized policy of building up his own forces before launching the next assault. This entailed risks and frequently caused his troops to outrun their communications, but the risks had been calculated and were fully justified by results. These tactics in Cyrenaica established the model for all later campaigns in N. Africa. See *E. Africa Campaign*; *India*; *N. Africa Campaigns*. Consult Wavell's dispatches on the Middle East, 1939-1941; *E. Africa*, 1940-41; *the Western Desert*, 1940-41; *Iraq, Syria, and Persia*, 1941-42; *India and Burma*, 1942; *Wavell, R. H. Kiernan*, 1945; *Life*, R. V. Collins, 1945; *Great Soldiers of the Second Great War*, H. A. De Weerd, 1946.

David Le Roi

Wavellite. In mineralogy, a complex hydrated phosphate of aluminium, sometimes containing fluorine and iron oxide.

Wave Mechanics. In physics, a theory originally evolved by Louis de Broglie (*q.v.*). Starting from the principle of the equivalence of mass and energy, it postulates that waves are associated with the mass-particles of any mechanical system. Just as Huygens's wave theory is necessary to explain diffraction effects with light, wave mechanics is necessary to solve problems connected with atomic and sub-atomic particles. De Broglie postulated that the waves associated with a particle of mass m and velocity v have a wavelength given by $\lambda = h/mv$, where h is Planck's constant. Experimental work on electrons, carried out by Davisson and Germer in America and G. P. Thomson in Great Britain, confirmed the theoretical suggestions of de Broglie. They obtained interference patterns from electrons by using the surface layers of crystals as diffraction gratings.

Wave Motion. The propagation of waves in a medium is the process whereby energy is transferred from one point to another without the medium itself travelling as a whole. An example is the up-and-down motion of a moored boat, by waves generated by a passing ship, or alternatively the resonance of a hollow box when struck by sound-waves from a distant source. The theory of wave motion is necessary for the explanation of many physical phenomena; there are, however, few natural examples of it which are directly observable except water waves and ripples, both complex wave motions.

Essentials of wave motion can best be grasped by considering the waves generated along a piece of rope, tied at one end, the other end being rapidly moved up and down. A wave of definite profile appears to start at one end and move down the rope until it disappears at the other. Actually, however, each part of the rope moves up and down in a regular manner, repeating its motion continuously. If each particle of rope is considered separately, it will be found that some are making the same kind of movement at the same time, *e.g.* those which form the crests of waves at one moment will subsequently form troughs at a given instant. The distance between two particles which are making exactly similar movements is called a wavelength; thus the distance between two adjacent crests or two adjacent troughs is the wavelength.

The speed with which the motion of the particles is transmitted from one to another, *e.g.* the velocity at which a crest moves forward, is known as the wave velocity. The number of times any particle moves up and down in a given period is called the wave frequency, and the extreme distance of displacement from a mean position is called the amplitude of the motion. The vertical distance between a crest and a trough is thus double the amplitude.

The connexion between wave velocity v , wavelength λ , and frequency ν is expressed by the equation:

$$v = \lambda \nu.$$

The period of a wave is the time a particle takes to complete a movement, and the wave number is the number of waves contained in one unit of length.

The type of wave motion already described, *i.e.* in a rope, is known as transverse, because the motion of the particles is in a direction at right angles to that of the wave itself. The propagation of light can largely be explained by considering it as a transverse wave motion travelling in a hypothetical ether. Instead of the displacement of material particles, as in the rope, here the strength of the electric and magnetic fields in the ether is the varying quantity.

Another type of wave propagation is that in which the particles are displaced from their mean positions in the direction of the wave. This is longitudinal wave motion. Its mechanism can best be understood by considering a model consisting of a number of balls hanging by cords, with springs fixed between them. If the end ball is given a blow, there ensues a to-and-fro motion which is imparted to all the other balls in succession. A wave of compression (when the balls are closely spaced) travels up the series, followed by one of rarefaction (when they are far apart). Sound is the best example of longitudinal wave motion. The molecules of the solid, liquid, or gas in which sound waves travel correspond to the spring-tensioned balls of the model; the wave is one of local compression and rarefaction in the medium.

Earthquake shocks are transmitted to surrounding parts of the earth by a variety of types of waves, some of which are transverse and some longitudinal. These seismic waves travel with different velocities and are received at

different times by a distant recording station.

Waves in water are more complex. By placing a cork on the surface of the water, the motion of its particles when a wave passes may be studied. First the cork is lifted up, then pushed forward, next let down, and finally pulled back. The motion is in fact approximately circular in the vertical plane containing the direction of motion of the wave. Water waves can thus be thought of as a combination of the transverse and longitudinal types.

The speed of waves varies widely, and often changes with the wavelength. Long sea waves on deep water, for instance, travel faster than short ones; but all ether waves travel through space at the same speed, 186,000 m. per sec. Through transparent materials the speed of ether waves is lower, and is also dependent on wavelength, which gives rise to the phenomenon of dispersion (splitting up of light into a spectrum). Sound waves travel through a substance at a speed depending on its compressibility and density, but independent of wavelength. Through air the speed is about 1,090 ft. per sec. at ground level, decreasing at higher elevations; through water its speed is 4,700 ft. per sec., this high value being due to the small compressibility of water.

Waveney. River of England. It rises in Norfolk near Bressingham, and flows past Diss, Bungay, and Beccles until it joins the Yare 4 m. above Yarmouth. In almost all its course of 50 m. it forms the boundary between Norfolk and Suffolk. It is navigable for barges as far as Bungay.

Waverley OR 'TIS SIXTY YEARS SINCE. First of the Waverley Novels by Scott. Begun in 1805, it was laid aside and published anonymously in 1814. With the Jacobite rebellion of 1745 for background, it contains memorable word-pictures of the Young Chevalier and his court at Holyrood, the battle of Prestonpans, and Highland manners, customs, and scenery. The title *Waverley* is derived from that of the hero, whose home was Waverley Honour, in Surrey.

Waverley Abbey. Ruined Cistercian monastery near Farnham, Surrey. Founded on a site by the banks of the Wey by William Giffard, bishop of Winchester, in 1128, it took many years to build, the church not being dedicated



Waverley Abbey, Surrey. Ruins of the 12th century monastery, the first Cistercian foundation in England

until 1278. The first Cistercian house erected in England, it was one of the largest, its precincts covering 60 acres. It was dissolved in 1536.

Waverley Novels. Collective name for the series of historical romances by Scott, of which Waverley in 1814 was the first and Castle Dangerous in 1831 the last. Some of them appeared anonymously, and others were grouped, e.g. as Tales of My Landlord. Their respective merits are suggested in the article on Scott, and each novel has its individual entry.

Wavre. Town of Belgium, in the prov. of Brabant. It lies on the river Dyle, 15 m. by rly. S.S.W. of Louvain, and has miscellaneous industries in metal working, paper and soap making, brewing, etc. Roman remains exist in the neighbourhood. Wavre was made a commune by John I of Brabant in 1293. Considerable damage to the town was done by the Germans in 1914.

Wavy. In heraldry, a line of division used on a shield or the outline of an ordinary (*q.v.*). It is undulating, possessing regular up-and-down curves to represent waves. See Heraldry colour plate.

Wax. Natural substance consisting essentially of esters formed by the combination of fatty acids with the higher monohydric alcohols. For example, beeswax contains large quantities of the esters formed by myricyl alcohol, $C_{30}H_{61}OH$, with palmitic acid, $C_{15}H_{31}COOH$, and with melissic acid, $C_{30}H_{61}COOH$. The waxes therefore differ from the vegetable and animal fats and oils in having no glycerine. All waxes are insoluble in water and are much less easily saponified by alkali than oils and fats. They are much harder than fats and have a characteristic smooth surface.

Paraffin waxes are entitled to the name only on account of their

physical properties; chemically they are totally different from true waxes, consisting of saturated hydrocarbons of the general formula C_nH_{2n+2} . Those containing 16 or more carbon atoms are solid at ordinary temperature; $C_{16}H_{34}$ melts at $18^\circ C$; $C_{60}H_{122}$ at $102^\circ C$. Of the natural waxes only sperm

oil is liquid at ordinary temperature; it is still used as a lubricant.

Of the animal waxes, beeswax has been valued from early times as a polishing agent, for modelling, and for candles. Wool wax (lanoline) is produced in large quantities in wool scouring; it is used in ointments and cosmetics, being easily absorbed by the skin. It also absorbs water readily to form a cream.

Of the vegetable waxes, carnauba from the Brazilian wax palm (*Corypha cerifera*) is the most important; very hard, it is used in polishes and candles.

Waxbill. Group of small finch-like birds (Estrelinae) occurring in Africa, S. Asia, and Australia. They are related to the weaver birds, and have rather long tails and glossy curved beaks.

Wax Chandlers. London city livery company. With records dating from 1371, it was granted a charter in 1483, arms in 1484 and 1536, and was founded to regulate the trade in wax candles, etc. The hall, at the corner of Gresham Street and Gutter Lane, rebuilt 1657 and 1852, was rendered unusable by German bombs in 1940.

Wax-flower or **HONEY PLANT** (*Hoya carnosa*). Climbing shrub of the family Asclepiadaceae. It is a native of Australia. The fleshy opposite leaves are oblong-oval; the pinkish, waxy-looking flowers are in umbels, whose common stalk starts from a lateral shoot.

Wax Moth. Name given to small moths of the genus *Galleria*. The best-known is *G. mellonella*, which has spread to many parts of the world including Australia. Its caterpillar is a pest of apiaries,

chiefly in weak or neglected colonies. It attacks the honeycomb by making silk-lined tunnels through the wax and feeds upon the latter.

Wax Palm (*Cerozylon andicolum*). A fine tree of the family Palmae. A native of Colombia, it grows to a height of about 150 ft., and has a spreading crown of leaves which may be 20 ft. in length. These are cut from the edges to the midrib into segments 2 ft. long and $1\frac{1}{2}$ ins. wide. The trunk is coated with a mixture of resin and wax, and the natives scrape this off after cutting down the tree, each trunk yielding on the average

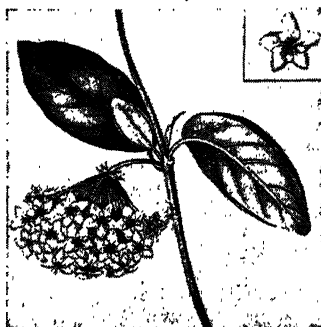


Wax Palm. Crown of leaves, and flower clusters of the tall palm

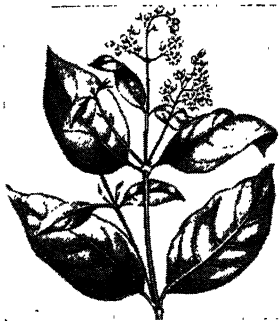
25 lb. of the highly inflammable wax. The name wax palm is also given to the Carnauba Palm (*q.v.*).

Wax Plant (*Cerinth major*). Annual herb of the family Boraginaceae, native of central Europe. It has smooth, stem-clasping, heart-shaped, glaucous leaves, with white dots. The tubular flowers are yellow at the base and purple above, arranged in sprays.

Wax Tree, AMERICAN GAMBAGE, or GUTTA-GUM TREE (*Vismia guianensis*). Shrub of the family Hypericaceae. A native of tropical America, it has four-sided stems, and opposite, oval-lance-shaped leaves. The yellow flowers are clustered at the ends of the branches. Its yellow resinous



Wax-flower. Leaves, and umbel of flowers. Inset, single flower



Wax Tree. Leaves and flower clusters of the American shrub that yields a resin similar to gamboge

juice yields a substance similar to true gamboge (*Garcinia*), with similar purgative properties.

Waxwing, SILKTAIL, OR BOHEMIAN CHATTERER (*Bombicilla*). Fruit-eating bird of the family



Waxwing. Crested bird occasionally found in Britain
W. S. Berridge, F.Z.S.

Ampelidae, native of N. Europe, but at rare intervals a winter visitor in flocks to Great Britain. Of a vinous brown colour, relieved by black and white markings, its distinctive characters are furnished by a handsome crest on the head and by curious red, wax-like appendages to the tips of the secondary wing-feathers and those of the tail. In Great Britain it affects hedgerows chiefly, feeding upon hips, haws, etc. The thick-walled nest is constructed of twigs, moss, lichens, and feathers, and contains five or six lilac-grey eggs with darker spots.

Waxworks. Effigies made of wax, generally beeswax. The ancient Egyptians fashioned fig-

ures of their deities in wax for funeral purposes, while the Greeks and Romans modelled wax figures for a variety of purposes. Wax dolls were common among the Greeks, while wax effigies of their ancestors placed in their houses were marks of distinction among the Romans. During the Middle Ages effigies of saints in wax, portraits, religious objects, and full-sized wax figures, some beautifully coloured, became common. From the 17th century onwards wax models for anatomical work and scientific work generally were much used.

The first waxworks show, depicting famous and notorious personages, appeared in the 17th century, the best-known of these early shows being that of Mrs. Salmon, opened in St. Martin's-le-Grand in 1690. The most famous modern waxwork show is Madame Tussaud's in London, which was opened in Baker Street in 1835. See *Bronze Statuary*; Tussaud.

Way, SIR SAMUEL JAMES (1836-1916). Australian statesman. He was born at Portsmouth, April 11, 1836, and settled as a lawyer in S. Australia, taking silk in 1871. He was appointed attorney-general in 1875 and lord chief justice the following year, and in 1891 became the first lieutenant governor of S. Australia. Sworn of the privy council in 1897, he was made a baronet two years later. He lived until Jan. 6, 1916.

Way Bill. Document containing a list of passengers and goods carried by a public company.

Waycross. City of Georgia, U.S.A., the co. seat of Ware co. Situated 95 m. S.W. of Savannah, it is served by the Atlantic Coast Line and others, being the converging point of nine rlys. It has large rly. workshops, and manufactures lumber products, cold storage machinery, and naval stores. Alligator hides from nearby swamps are cured here for the market. Settled in 1870, Waycross was incorporated in 1874, and became a city in 1909. Pop. 16,763.

Wayfaring Tree (*Viburnum lentana*). Small tree or shrub of the family *Caprifoliaceae*. It is a native of Europe, N. and W. Asia, and N. Africa. The unripe wood and the leaves are rough with stellate hairs. The large, opposite leaves are heart-shaped, with toothed edges. The white funnel-shaped flowers are in large flat-topped clusters at the ends of the branches. The bark has acrid, blistering properties.

Wayland the Smith (Old Low Ger. *weland*, craftsman). In Teutonic mythology, a wonder-working smith, lord of the elves. The son of the sailor-hero Wade or Wate and a mermaid, he is the maker of a magic boat, a winged garment, and many famous swords. The Old Norse *Völundarkvitha* relates the story of his capture of a swan-maiden and his fight with the smith Amilias. His deeds are represented on the Franks casket in the British Museum. Wayland Smith's forge is a cave in the Vale of the White Horse, near Ashbury, Berkshire.

Wayleave. In law, permission granted by an owner of property to enter the property for some specified purpose at reasonable hours. See *Easement*.

Wayne, ANTHONY (1745-96). American soldier. Born in Pennsylvania, Jan. 1, 1745, he was associated as a surveyor with Benjamin Franklin. During the War of Independence he fought with distinction at Brandywine, Germantown, Valley Forge, and Monmouth. In 1779 he stormed Stony Point, and afterwards was with Lafayette in Virginia, and at the siege of Yorktown. After leaving the army in 1784, Wayne was a member of the legislature of Pennsylvania, and sat in congress for Georgia. In 1792 he was made commander-in-chief, directing the operations against the Indians until his death, Dec. 15, 1796. He was popularly known as Mad Anthony. Consult *Mad Anthony Wayne*, T. Boyd, 1929; *A Gentleman Rebel*, J. H. Preston, 1930.



Anthony Wayne, American soldier
After J. Herring



Wax Plant. Spray of leaves, tubular flowers, and fruit. See facing page



Wayfaring Tree. Flower cluster and leaves. Left, ripe fruit

Ways and Means. In British parliamentary procedure, a committee of the whole house of commons to consider proposals for financing the country. Such a committee debates the budget proposals and votes sums of money from the consolidated fund to meet supplies granted for the public services during the financial year. Its chairman is normally the deputy speaker. *See* House of Commons; Parliament.

Wayzgoose. Name given to the annual outing and dinner once general in connexion with English printing offices. The word means stubble-goose, or young goose suitable for a feast. The Wayzgoose is the title of an early poem by Roy Campbell. *See* Beanfeast.

Wazirabad. Town of Pakistan, in the Gujranwala dist. of W. Punjab. It is on the left bank of the Chenab, and on the rly. about 20 m. due N. from Gujranwala. A fine rly. bridge, the Alexandra, here crosses the river; originally 3,000 yds. long, it was reduced to 800 in 1927. A trunk road also crosses the river. Founded by Wazir Khan in the reign of Shah Jehan, the town was rebuilt under Ranjit Singh. Boats are built, cutlery is made, and Wazirabad swords, sticks, and tennis racquets are famous. Pop. 27,079.

Waziri. Pathan tribe of the Pakistan-Afghan frontier. They speak a S. Pushtu dialect, are of democratic nature, and formerly waged implacable warfare against the Ghilzai. Much fighting took place between the tribesmen and the British at various times.

Waziristan. Region between the Durand line (Afghan frontier) and the Trans-Indus administered districts of the N.W. Frontier province, Pakistan. It averages 60 m. from E. to W. and 160 m. from N. to S. The W. half consists of the Suleiman Range, gradually rising up to 10,000 ft. It is tribal territory with rugged ravines, fiercely hot in summer and bitterly cold in winter. It is bounded in the S. roughly by the Gomal river, and in the N. by the Kurram river valley. The country is sparsely covered by grass on the lower plateaux, and in the submontane tracts from the hills to the Indus varies from highly cultivated and irrigated land to desert.

The inhabitants are chiefly Waziris and Mahsuds. Once the Waziris were the chief inhabitants, and the country takes its name from a chieftain called Wazir, whose grandsons were the actual founders of the race. The Mahsuds,

themselves of Waziri descent, have been the more vigorous of these two Pathan tribes. They are constantly torn by inter-tribal feuds and unite only when some religious war gives them a common cause in their Islamic faith. At the end of the First Great War the breakdown of the frontier militia led to serious operations in Waziristan, and eventually the British decided to establish posts in the country and by means of a circular road to combine non-interference with the tribes in their villages with swift action when they ventured to attack the settled districts of the province. Razmak, within sight of Makin, the Mahsud capital, was created a strong military headquarters, and an outpost in S. Waziristan was Wana.

To help in the pacification of the country local inhabitants were enrolled as khassadars, who received allowances for policing the roads, but this system broke down in 1937. During the Second Great War the outposts in Waziristan had to be supplied under active service conditions owing to the restlessness of the tribesmen. When in 1947 the transfer of power brought Waziristan under the control of Pakistan, that govt. withdrew troops from the interior of the country but maintained the allowances to the tribesmen.

The basic problem of Waziristan is economic. The land breeds faster than it feeds. Primitive methods of irrigation in the precariously poised reaches where crops are grown are not sufficient to cope with occasional onslaughts from nature. The swift-running mountain streams, such as the Tak-i-Zam, may suddenly be swollen into torrents, and the resulting spate deprives the tribesmen of the fruits of his labour; so raiding is an important secondary occupation for these hardy, and not unattractive, hillmen. They have also been accustomed to move into the Punjab at certain seasons of the year to work on canal and road building.

Edwin Haward

Wazzan. Town of Morocco. About 56 m. N.N.W. of Fez, with which there is rly. connexion, it contains the tomb of Idrisi Sherif, and is a place of pilgrimage. Pop. 16,442.

Weald (A.S., a forest tract). Term meaning any forest or woodland. Specifically the Weald is that district in Kent, Surrey, and Sussex that lies between the N. and the S. Downs, and extends from the borders of Hampshire to the English Channel, being about 120 m.

long and 30 wide. Formerly covered with forests, of which there are remains in Ashdown and St. Leonards Forests, and known as Andredsweald, it was the chief centre of the iron industry, wood being used for smelting the ore.

Wealden Deposits. In geology, series of deposits of the Lower Cretaceous, so named from their typical appearance in the Weald, England. The series is subdivided into two main groups, Hastings Sand and Weald Clay. The former is further split up into basal Fairlight clays, Ashdown sands, Wealdhurst clay, and Tunbridge Wells sand. The Wealden beds as a whole were laid down in a great lake of fresh or brackish water, the N. edge of which lay roughly below or a little N. of the line of the North Downs.

Wealdstone. Parish and rly. station of Middlesex, England. It is part of the urban dist. of Harrow (*q.v.*).

Wealth (O.H.G. *welitha*). Originally the state of being well, an idea surviving in the words commonweal, commonwealth. Now the word is ordinarily used to denote things that are thought conducive to well-being, particularly money, property, possessions, great possessions of non-material things (*e.g.* wealth of friends, of knowledge), etc. The natural wealth of a country is its store of minerals, source of water-power, fertility of soil, conditions of climate, and other circumstances that may make it productive.

Economics has been called the science of wealth; but most economists have used the term wealth in a somewhat narrower sense to denote (*a*) all commodities that satisfy wants directly or indirectly but are limited in quantity and hence can be exchanged for other things; and (*b*) rights to share in such things (*e.g.* contracts conferring a right to payments). All desirable things may be called goods. Air and the light as one walks along the road are freely available; they are called free goods. Fresh air and light in an underground rly. require expenditure to make them available; they are economic goods. Wealth in the sense (*a*) mentioned above means economic goods taken collectively. As Taussig pointed out, "A community is better off, the more free goods it has and the less the range of things that come within the category of wealth." A free good of one person or community may be an economic good and part of the wealth of another; *e.g.* the

scenery of Scotland or Switzerland, free to the inhabitants, is costly to others. According to interpretation (a), money is not wealth (except to a miser, to whom it may have a high capacity to satisfy a want), but merely a right or claim to wealth; interpretation (b) includes, as part of wealth, money and all such "representative goods" as mortgages, marketable securities, govt. stocks.

For this reason it is convenient to distinguish between individual wealth and social wealth. The latter includes all economic goods owned by individuals, companies, corporations, local govt. authorities, public bodies, and the crown (including such communal property as roads, schools, museums, hospitals, harbours, fire brigades, etc.); and if section (b) is included within the definition, all oversea investments and loans held within a country, less all investments in the country by foreigners. Individual or private wealth consists of all economic goods privately owned; and admitting section (b), all property rights having an exchange value. The social income may be considered as the total satisfactions that flow from social wealth and from economic activity during any period. It is commonly measured in terms of money, but only inadequately. The share of the social income enjoyed during a period by an individual is his real private income; this also is quite inadequately indicated by his money income, since much real income flows from social wealth used free of charge.

Although wealth consists of things that have an exchange value, value creation is not the same as wealth production. The latter denotes an addition to the quantity or the number of economic goods; the former, an increase in the power of some economic goods to exchange for others. A person who created a scarcity of corn by burning some might give to the remaining corn a total value greater than the whole stock of corn previously held; but he would have lessened, not increased, wealth. Wealth is produced only by organizing the use of land, labour, and usually capital to increase either the quantity of commodities (material or non-material) or their utility, i.e. their capacity to satisfy human wants, by altering their form or physical qualities; or by making them available at some other time or place. Wealth is produced by industry and trade, but not all industrial and com-

mercial activities add to social wealth. For this reason economics is largely a study of the relation between individual wealth and social wealth.

The belief that money is wealth, indeed "wealth in a fuller sense than anything else," has profoundly affected human history. This idea of the mercantilists, developed from the 15th century and dominant until the end of the 18th, led to the attempt by individual nations to achieve a surplus of exports, so that the balance might be received in "treasure," or gold and silver. A balance of trade was favourable when exports exceeded imports. The notion still lingers. It partly explains why the U.S.A. came to accumulate between the Great Wars about four-fifths of the world's stock of gold, which it was considered necessary to isolate from world economy by storing it in Fort Knox, Ky. See Balance of Trade; Capital; Economics; Mercantile System; Value.

H. Watson

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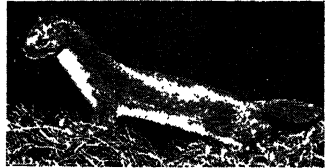
Wealth of Nations. Work on political economy by Adam Smith (*q.v.*), the most famous of its kind. It appeared in 1776, and ranges over the whole field of economics. It is divided into five books. Book I deals with the product of labour and its distribution; II with the native accumulation and employment of stock; III with the progress of the various nations in wealth; IV with systems of political economy; V with national revenue. The book still forms the starting-point of the study of political economy, although some of its theories have been discredited. Many editions have appeared.

Wear. River of co. Durham, England. It rises E. of Cross Fell and flows 65 m. by a S. curve to the North Sea at Sunderland. Its basin of 456 sq. m. contains the S. portion of the Durham coalfield. Barges can ascend as far as Durham. Other places on the banks are Bishop Auckland and Chester-le-Street. In its upper course the Wear flows through

much beautiful scenery. *Prom. Weer.* See Durham; Sunderland.

Wearing of the Green, THE. Irish national song. The music is more than half a century older than the words, to which it was not adapted until 1797. The origin of both is unknown.

Weasel (*Mustela nivalis*). Small carnivorous mammal. It is found throughout Europe, N. and Cen-



Weasel. Small predacious mammal, common to most countries of the Northern hemisphere

tral Asia, and in parts of N. America, being common in England and Wales and S. Scotland, but is absent from Ireland. It is about 9 ins. long, and has bright reddish-brown fur on the upper parts, with white beneath. In cold regions the animal turns white in winter, but this does not occur in Great Britain except occasionally in the Scottish Highlands. It makes its home in holes in banks—sometimes utilising a deserted rabbit burrow—and here a nest of grass and leaves is made for the young, of which there are usually two broods in the year. Predatory in habit, it kills rats, mice, voles, rabbits, game birds, poultry, etc. The weasel hunts by scent, and will follow a prospective victim unweariedly until the latter is worn out. See Glutton; Protective Colouring.

Weather. Term denoting the appearance of the sky, the occurrence or otherwise of rain, snow, or other precipitation, the presence of fog, mist, etc. In its widest sense it refers to all the meteorological factors which affect human beings. Thus, in order to describe fully the state of the weather at any particular time or during any particular day, the observations must comprise temp., humidity, direction and speed of the wind, precipitation, visibility, clouds, optical phenomena, e.g. rainbows, halos, etc. Barometric pressure, although not included in the general use of the term, is of fundamental importance in meteorology and is recorded with the more commonly understood elements of weather. Most of the observations are made by instruments designed specially for the purpose, the remainder being

personal estimates. Weather represents the combination of all the elements at a given instant of time; climate, day-to-day weather conditions averaged over a year.

For conciseness, a code of letters indicating the state of the weather, and originally intended for use at sea, was introduced in the 19th century by Admiral Sir Francis Beaufort. With certain additions and extension to land stations, it is used in the British meteorological services. There is also in use an international system of symbols. The principal Beaufort letters and international symbols are given in the table.

BEAUFORT LETTERS AND INTERNATIONAL SYMBOLS			
blue sky	b	squall	q ^
cloudy	c	drizzle	d ,
overcast	o	sleet	rs *
gloom	g	thunder	t T
line squall	kq	thunderstorm	tl =
gale	\	mist	m =
rain	r •	dew	w ^
snow	s *	rime	v
hail	h ▲	snow lying	☐
lightning	l <	lunar halo	☾
fog	f ≡	aurora borealis	△
haze	z ∞	solar halo	⊙
hoar frost	x L	rainbow	∩
glazed frost	∞	zodiacal light	∩

A capital letter is used to denote heavy intensity and the small suffix o for slight intensity. Continuity is indicated by repetition of the letter. The prefix i indicates "occasional" or "intermittent," and p applied to rain, snow, etc., indicates "passing showers." If the international symbols are used, the exponent 0 or 2 is added to distinguish slight or heavy intensity, respectively, from moderate. Hence, continuous heavy rain, in one system, is represented by R.R. and, in the other, by \bullet^2 . Certain additional symbols are used for plotting weather on synoptic charts. (See *Climate; Meteorology; Weather Ship. Consult The Drama of the Weather*, Sir W. N. Shaw, 1938.)

WEATHER FORECAST. This is a studied prediction of the nature of forthcoming weather. Forecasting personnel of an official meteorological service are therefore mainly concerned with: (a) detailed short-period forecasts for aviation; (b) forecasts covering periods of 24 hrs. for the general public; (c) further outlooks, in more general terms, for as long ahead as possible; (d) notification of short spells of fine weather; (e) warning

of gales, snowstorms, thunder, fog, and cold weather; (f) special forecasts for industrial and technical purposes. No sufficiently trustworthy method has been developed for inferring the weather to be expected some days, weeks, or months ahead. Some success, however, has been claimed in India with seasonal forecasts of the monsoon rainfall.

In the forecast room at a meteorological station (see under *Meteorology*) all the observations available are plotted by an elaborate system of symbols on large-scale charts, and the isobars, or lines of equal barometric pressure, are drawn in. These lines resemble the contours of an ordnance survey map, forming, in effect, hills and hollows, valleys and ridges; in some places the gradients are steep and in others gradual. If drawn over a sufficient area, the isobars appear as closed curves enclosing centres of low or high pressure.

The region around the centre is termed, respectively, a depression or an anticyclone. To the intervening regions special names such as trough and ridge are sometimes given. Study of synoptic charts, however, is chiefly devoted to consideration of the characteristics of the different air masses, i.e. masses of air each of which is fairly uniform in itself but differs, often markedly, from its neighbours, owing to its place of origin and the path along which it has travelled. The boundary lines, or fronts as they are called, which indicate the transition from one air mass to another are of particular importance in understanding current weather and in making a forecast of the weather for the immediate future.

Before the Second Great War forecasting was generally based upon surface weather charts only, but development of radio sonde and radar apparatus has resulted in a three-dimensional representation. These techniques also provide a much more accurate means of assessing e.g. the winds an aircraft is likely to meet during a flight, and likelihood, or otherwise, that ice may form on it. Radio

receivers, used to track thunderstorms, and the network of ocean weather ships, inaugurated in the Atlantic in 1947, also proved valuable aids to the forecaster. (See *Anticyclone; Cold Front; Depression; Warm Front.*)

WEATHER LORE. This term applies to rules, maxims, proverbs, etc., in folklore, which purport to foretell the weather. In general, there is little truth in most of these sayings, especially where an attempt is made to predict weather an appreciable time ahead. For example, by examining the rainfall which actually occurs in the month or so following S. Swinburn's day (July 15) over a number of years, it is easy to demonstrate the unreliability of the proverb, If S. Swinburn's greets the weather will be foul for 40 days. The belief that "January commits the fault and May bears the blame," i.e. a mild Jan. will be followed by a wintry spring and a cold May, was shown to have no particular significance in an investigation by D. Brunt into 100 years' record of London temps.: of the springs which followed the 18 warmest Jans. in the period, seven were warm, four cold, seven average; four Mays were warm, eight cold, six average. A similar test revealed that no reliance can be placed upon the statement that a wet summer nearly always precedes a cold stormy winter.

Of the maxims which relate weather to the appearance of the sky, the best known is

Red sky at night, shepherd's delight;
Red sky at morning, shepherd's warning;

which has Biblical authority (Matt. 16, 2-3). Such predictions are more reliable. Weather usually travels from W. to E., and a red sunset indicates the absence of clouds and the presence of dry air to the W.—hence the possible approach of fine weather; on the other hand, a red morning sky may be due to clouds of threatening, bad weather being illuminated from below. The maxim "a nor-wester is not often long in debt to a sou-wester" is frequently true, since there is a tendency for depressions to follow one another closely in families across the Atlantic. In Yorkshire it is said, "Do business with men when the wind is in the N.W.": except when it occurs in the rear of a depression, the N.W. wind gives bright sunny mornings and perhaps showery afternoons, but seldom long-continued rain. One of the most extraordinary of

weather phenomena is the frequent occurrence of exceptionally good visibility before rain, giving rise to the Cornish saying, "When the Lizard is clear, rain is near." Rainbows, too, are often quoted as signs of coming weather. Haloes can be found on high clouds after the passage of depressions as well as at their fronts, and therefore can be associated with good or bad weather. There is no truth in the weather lore which is concerned with the changes of the moon. *See Meteorology.*

A. J. Drummond, F.R.Met.S.

Weathercock. Vane for showing the direction of the wind. It is a thin vertical plate of metal, or wood, pivoted on a vertical rod, and is generally gilded, and made in some decorative or fanciful form, often that of a cock, the emblem of vigilance, though many other designs have been used. It is placed on a staff or above a spire, steeple, or roof. The original weathercock is said to have been the brazen Triton on the tower of the winds in Athens, erected about 100 B.C.

Weatherhead, LESLIE D. (b. 1893). British divine, born in London, and educated at Rich-



Leslie D. Weatherhead, British divine

mond theological college and London university. After serving as a chaplain in the First Great War, he took charge of a Methodist church at Madras. Minister of Brunwick Methodist church, Leeds, 1925-36, he then moved to the City Temple, London. He taught and lectured on psychology and was an examiner in that subject for Wesleyan Methodist ordination candidates, but is best known for books on religion addressed to the man in the street: *e.g.* After Death, The Mastery of Sex, Jesus and Ourselves, Thinking Aloud in Wartime.

Weather Helm. In nautical language, condition of the helm when put or held slightly toward the weather side. The tendency of a sailing vessel to come up into the wind makes it necessary to put the helm up.

Weathering. Process of decomposition which occurs in the superficial layers of built structures, or in natural features like rocks, when exposed to atmospheric influences.

In geology, weathering may be physical (rock breaking) and chemical (rock decay). The two processes commonly operate together. Climate strongly influences the type of weathering: in Arctic or sub-Arctic regions frost action only is at work. In temperate regions, *e.g.* the British Isles, frost action and chemical processes are both active. In desert areas the mechanical breaking of rock by changes in temperature and the wearing away by sand-blast action of the wind are predominant. Frost action and temperature change are the two most important processes of mechanical weathering. Water freezing in cracks and pores in the rocks expands and enlarges the cracks; when the ice melts pieces fall away. Scree slopes are thus formed at the foot of cliffs. Diurnal heating and cooling of rock surfaces cause uneven thermal expansion and contraction in the mass; the daily repetition of this strain on the rock causes it to crumble, or the surfaces to flake off (exfoliation).

Chemical weathering is brought about by the percolation of rain into the rocks and the action of water, as well as oxygen, carbon dioxide, and sulphur dioxide, in solution. Silicate minerals may thus be broken down, and alkalies, lime, and magnesia removed in solution. In big cities where the atmosphere is polluted by sulphurous smoke, the rainwater is relatively acid, and has a

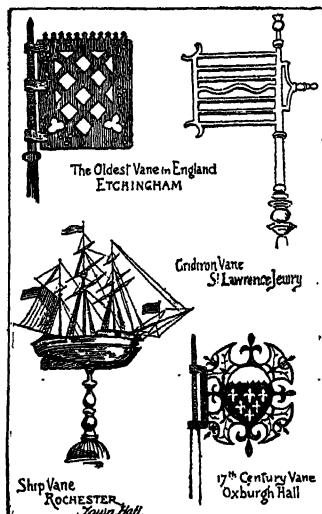
deleterious effect on building stones not carefully chosen. Chemical weathering changes the hard original rock-forming minerals to soft hydrated clay minerals, an exception being quartz. (*See Erosion; Geology; Rock.*)

WEATHERING OF BUILDINGS. Driving rain, charged with sulphurous acids, in industrial towns, sets up chemical action which gradually eats away limestone facings. Dust-laden wind also attacks buildings, particularly cornerstones which receive the full force of the wind from more than one direction. Clinging mosses and parasitic vegetation have a disintegrating effect on buildings as they retain moisture; where there is heavy growth they crack the structure to which they cling. Iron cramps, dowels, and rods cause weathering through the expansion of the metal during oxidation. When limestone and sandstone are used together, chemical reaction between the two will induce weathering.

All building stones should be laid on their natural beds, particularly on projecting courses. Tops of cornices, sills, etc., are sloped to throw off water and snow and so prevent moisture seeping into the structure. Window sills, thresholds, and other openings of wood or metal have their sloping tops covered with an impervious material such as lead or asphalt. Such protective devices should terminate in a drip carried some distance beyond the structure to which it is attached. Slate and tiled roofs are arranged to prevent weathering where the slates or tiles abut against walls or chimneys. In the building industry, in fact, the term weathering generally denotes prevention rather than effect.

METALLURGY. Weathering describes a method for detecting surface defects in steel or iron by exposing the metal in the open air. Rusting tends to be more severe in the vicinity of a defect. The process has been superseded almost completely by the faster method of pickling (*q.v.*).

Weatherly, FREDERIC EDWARD (1848-1929). British lyric writer. Born at Portishead, Somerset, Oct. 4, 1848, he was educated at Hereford and Brasenose College, Oxford, and called to the bar at the Inner Temple in 1887. He wrote the words for such popular songs and ballads as Nancy Lee, The Deathless Army, The Old Maids of Lee, To-morrow will be Friday, The Holy City, Up



Weathercock. Ornamental vanes of varied design and shape, from old English buildings

From drawings by G. G. Harper

from Somerset, Roses of Picardy. Many of his most successful lyrics were set to music by Sanderson.



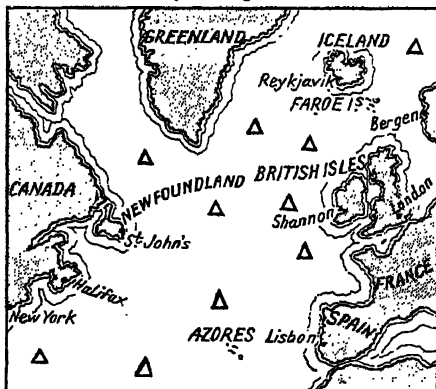
F. E. Weatherly, British lyric writer

Weatherly wrote Muriel and Other Poems, 1870; The Rudiments of Logic, 1879; many children's books; and English versions of Cavalleria Rusticana, 1892, and Pagliacci, 1893. His reminiscences, Piano and Gown, appeared in 1926. He died Sept. 7, 1929.

Weather Ship. Vessel designed and equipped for the collection of meteorological data in mid-ocean. By an international agreement reached at London in 1949, ten ocean weather stations were established in the N. Atlantic. Four are entirely maintained by the U.S.A., in addition to one in co-operation with Canada and another with the Netherlands; Great Britain operates two, one of them in cooperation with the Netherlands; Norway operates one, with financial help from Sweden, Belgium, and Denmark;

France is responsible for one in cooperation with the Netherlands. Most of the vessels are of a small naval type, the British vessels being converted wartime corvettes, each manned by 53 officers and men. Upper-air observations are carried out by means of radio-sonde (q.v.), and, together with sea surface weather data, are transmitted to shore stations every three hours. Weather ships also make meteorological and hydrological research, supplement the work of the international ice patrol, provide radio beacons for ships and aircraft, and go to the rescue of ships or aircraft.

Weaver. River of Cheshire, England. It rises in the Peckforton Hills, in S.W. Cheshire, and flows mainly N. past Nantwich and



Northwich for 50 m. to the Mersey near Frodsham. Below Northwich for the lowest 20 m. of its course the embanked river becomes the Weaver Navigation, used by steamers and barges connected with the trade in chemicals and salt, the necessary locks having been begun in 1720. It is connected with the Trent and Mersey canal, vessels being raised by a lift to the level of the canal.

Weaver Bird. Popular name applied to several genera of small birds whose nests are covered by grass-woven bags. Of bottle or flask shape, the entrance to the nest is at the bottom or low down at the side. The Baya sparrow or weaver bird (*Ploceus baya*), of India and Ceylon, attaches its hour-glass- or retort-shaped nest to the fronds of palms, weighting them with clay to prevent inordinate swaying. A South African species (*Phopasser mahali*) constructs a nest shaped like a Florence flask inverted. Somewhat similar nests are fashioned by the weaver finch (*Hyphantornis pensilis*) of Madagascar, and other

species. The social weaver birds (*Philetaerus socius*) of S. Africa combine to load an acacia tree with bushman grass, weaving some of it into a roof. In hollows of the in-



Weaver Bird. Left, Jackson's Whydah Bird, one of the weavers. Right, typical bag, woven of long grasses, to protect the nest

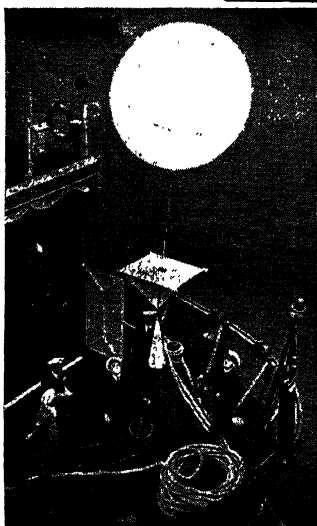
terior dozens of pairs of the birds construct their nests.

Weavers' Company. City livery co. of London. It existed from the 12th century, the first of its 12 charters, signed by Thomas Becket, being granted by Henry II, and the last by Queen Anne. The hall in Basinghall Street was taken down in 1856. The office of the company is at 7, Queen Anne's Gate, S.W.1.



Weavers' Co. arms

Weaving. Operation performed by means of a loom in which two sets of threads are interlaced at right angles to form a fabric. The most primitive loom had a series of threads hanging vertically from a wooden bar, and the crossing threads were passed through from one side to the other, alternately in front of and behind the hanging threads. Probably the addition of a second wooden bar at the bottom of the hanging threads, to keep them taut, was a very early improvement. To give a coherent simple woven fabric, the crossing thread (weft) is threaded through the hanging threads (warp) so as to pass in front of all odd-numbered threads and behind all even-numbered threads as it is moved from left to right, and behind all odd-numbered threads and in front of all even-numbered threads in the return movement from right to left. Hand-operated looms in which the warp hangs vertically are still in use in parts of Asia, but



Weather Ship. Releasing a meteorological balloon from the Weather Observer, the first of the weather ships to be completed. The balloon's storage hangar is on the left. The map illustrates the positions of the ten vessels maintained in the North Atlantic (1949)

the early Egyptians used a primitive loom with the warp threads held horizontally, and this variation was necessary before any attempt could be made to increase the size of the article woven beyond a few square feet. In a primitive loom the newly-inserted weft thread was pressed up against its predecessor with a comb-like instrument held in the weaver's hand. The labour of passing a ball or spool of thread alternately above and below a series of warp threads, which even in a narrow coarse cloth may be 200 or more in number, is obvious, and the device called the heddle was invented very early; in its primitive form it consisted of two bars containing holes, all odd-numbered threads being passed through the holes in one, and all even-numbered threads through the holes in the other. By lifting one heddle, all odd threads are raised, and the spool of weft can be pushed through from one side to the other. That heddle is then released, and the other one raised for the return traverse of the weft. Further progress varied from place to place, but certainly by the 15th century in England the horizontal loom had been developed into a framework on which comparatively long lengths of warp threads were wound on to a roller or "beam" whence they passed to the heddles, and on to a second roller at the front, on which the woven cloth was wound, while the weft yarn was contained in a boat-shaped shuttle with pointed ends, which was easier to thread through than a simple spool or ball of thread. This form of loom remained virtually unchanged for several centuries, and is still made in a small form for hand weaving scarves and handbags lengths.

Invention of Loom Box

In 1733 John Kay of Bury fitted on either side of the loom boxes to hold the shuttle; by means of a cord these boxes could be given a sudden jerk, causing the shuttle to be thrown across the loom into the box at the other side. For this to succeed, one set of threads had to be held firmly against a transverse board (shuttle-race), while the other was lifted sufficiently to allow space for the shuttle to "fly" across. A "sley" the full width of the fabric, containing a "reed" of parallel wires mounted in a frame, so arranged that two threads lay between each pair of wires, the whole pivoted on the loom, replaced the hand-comb; the sley, swung behind the shuttle-race

until the shuttle had been thrown across, and then swung forward, pressed the whole of the new weft "pick" into place in the "fell" of the cloth in one easy motion. In 1760, Robert Kay invented the "drop-box," in which there were three or four shuttle boxes instead of one, and any one of these could be raised to the level of the race, as desired. Each could be charged with a different colour or kind of weft, so that weft-way stripes of different colours and designs, such as checks, could be woven.

Weaving of Patterns

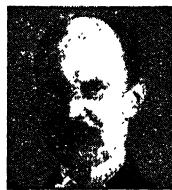
Meantime, the simple pair of heddles had been replaced by a number of "shafts" containing wires with an eye in the centre, through which the warp threads passed. Using four shafts, with one quarter of the warp threads passing through the eyes or "mails" of each, it becomes possible to raise the first, fifth, ninth, etc., warp thread by raising one shaft; the second, sixth, tenth, etc., by raising the next; the third, seventh, eleventh, etc., by raising the third; and so on, thus permitting the weaving of simple twills and similar designs. The number of shafts that can be raised as required by a simple mechanism is limited to about eight, permitting the weaving of satins and many fancy cloths. On power looms, up to 24 shafts can be used.

In 1785-87 the power loom was patented by Cartwright, and its introduction during the ensuing years was violently opposed by the hand-loom weavers. In 1804, Jacquard invented an arrangement whereby instead of lifting warp threads in sets by shafts, each single warp thread could be lifted independently, if desired, the whole having a control mechanism worked by punched cards and feeler wires; on this loom very elaborate patterns such as damasks, brocades, etc., can be woven comparatively simply.

The hand loom also had become a more elaborate machine, with the shafts or Jacquard mechanism worked by a foot treadle, and the cords from the shuttle boxes joined together at a small handle, which was simply jerked first to the left and then to the right. Hand looms of this type are still used in village industry and to teach students the principles of weaving. They were preferred for some purposes long after the power loom had been established, e.g. most Paisley shawls were woven at home on hand looms. But the comparative slowness of the hand loom, and the

skill required for its use, gradually ousted it, since it could not meet the demand for cheapness and rapid production, though some hand-woven fabrics have a quality and individuality which cannot be imitated by the power loom. *See Loom; consult also Handicraft Art of Weaving, T. Woodhouse, 1921; Weaving with small Appliances, L. Hooper, 1922; Weaving, Crankshaw, 1935; Textile Design and Colour, W. Watson, 1947.*

Webb, Sir Aston (1849-1930), English architect. Born May 22, 1849, the son of Edward Webb,



Sir Aston Webb,
British architect

a painter, he became an architect. He designed the Victoria and Albert Museum, the Imperial College of Science and Technology, S. Kensington, Admiralty Arch, and the new front of Buckingham Palace. In ecclesiastical design his best achievement was the scholarly restoration of S. Bartholomew the Great, Smithfield. Elected A.R.A. in 1899, he was chosen R.A. in 1903 and was knighted in 1904. From 1919 to 1924 he was president of the R.A.; he was also president of the architectural association. He died Aug. 21, 1930. *See Admiralty Arch.*

Webb, Mary (1881-1927), British novelist. Mary Gladys Meredith was born at Leighton, Shropshire, March 25, 1881, and became a journalist in youth. She married a schoolmaster, Henry Bertram Webb, in 1912, and her first novel, *The Golden Arrow*, appeared in 1916. Later novels, *Spring of Joy*, 1917, *Gone to Earth*, 1917, *The House in Dormer Forest*, 1920, and *Seven for a Secret*, 1922, passed almost unnoticed; but with *Precious Bane*, 1924 (awarded the Femina-Vie Heureuse prize), she attracted wide attention, partly through the public praise of Stanley Baldwin, then prime minister. Her last novel, *Armour Wherein He Trusted*, 1926, was her most mature work. She died at St. Leonards, Oct. 8, 1927.

Mary Webb possessed Hardy-esque qualities. Her novels, set in the dour country of Shropshire or



Mary Webb,
British novelist

the Welsh marches, are imbued with a sense of implacable fate. She excelled in descriptions of country life, of which her knowledge was accurate and immense; her characters were vivid, though primitive. A dramatised version of *Precious Bane* was performed in London in 1932. A selection of her poems was published, 1947. *Consult Lives* by H. Addison, 1931; T. Moulst, 1932.

Webb, MATTHEW (1848-83). English swimmer, popularly known as Captain Webb. He was born at



Matthew Webb,
English swimmer

Dawley, Shropshire, Jan. 18, 1848, and when a boy saved his brother from drowning in the Severn; later he rescued a companion who had fallen overboard from a steamer in the Mersey. He served in the mercantile marine and was awarded the first Stanhope gold medal by the Royal Humane Society in 1874. On Aug. 24-25, 1875, he swam the English Channel from Dover to Calais in 21½ hours. He lost his life in an attempt to swim the whirlpool and rapids below the Niagara Falls, July 24, 1883.

Webb, SIDNEY AND BEATRICE. The work of these British sociologists is described under his title, *Baron Passfield*.

Webb City. City of Missouri, U.S.A., in Jasper co. It is 10 m. S.W. of Carthage, and is served by the St. Louis and San Francisco and the Missouri Pacific rlys. Incorporated in 1876, it became a city a year later. Mining zinc and lead affords the chief occupation; flour-milling and the manufacture of machinery are carried on.

Weber. Practical unit of magnetic flux. It is equal to 10^8 maxwells (C.G.S. units), and is named after Wilhelm Eduard Weber (1804-91), German physicist, who devised an absolute system of electrical units and developed a molecular theory of ferromagnetism.

Weber, ALFRED (b. 1868). German sociologist. He was born at Erfurt, July 30, 1868, brother of Max Weber (1864-1920), who was a political leader of the early Weimar republic. Alfred was professor of economics successively at Berlin, Prague, and Heidelberg from 1899 to 1933, then being dismissed by the Nazis. On the collapse of the Hitler regime in

1945 he re-emerged as an original thinker, and his writings on the social mission of economics exercised influence on German thought.

Weber, CARL MARIA FRIEDRICH ERNST VON (1786-1826). German composer. Of noble family, he was



Carl von Weber,
German composer

born at Eutin, Oldenburg, Dec. 18, 1786. His father, Franz Anton, was an able musician; his mother had been a Viennese singer. On her death in 1798 the family moved to Vienna, where Carl's Six Fughettas were published. Having already written Peter Schmolli and other operas, in 1803 he studied under Abt Vogler and became director of the Breslau opera. He left there in 1806 for a court appointment in Stuttgart, but became involved in trouble which necessitated his removal to Darmstadt, where in 1811 he composed *Abu Hassan*.

During 1813-16 Weber was director of the opera at Prague, and wrote much excellent piano music; then he obtained a similar post at Dresden, where he wrote his masterpiece, *Der Freischütz*, which was produced in Berlin, June 18, 1821. Four days earlier his *Preciosa* had appeared in the same city, and the two operas had an enormous success. His next work was *Euryanthe*, brought out in Vienna, Oct. 25, 1823. In 1825 he began *Oberon*, specially written for Covent Garden Theatre, himself learning English so that the music should fit in with the English accentuation and style of declamation. He visited London early in 1826 and produced the opera on April 12. But he was far gone in consumption, the strain of producing proved too great, and he died on June 5. In romantic opera Weber was the forerunner of Wagner; his music lacked nothing in drama or melody, but is uneven in arrangement. His *Life* was written by his son, M. M. von Weber, 1864-66.

Weber, ERNST HEINRICH (1795-1878). German physiologist. Born at Wittenberg, June 24, 1795, he early acquired a reputation as a brilliant theoretician, and became professor of anatomy, 1818, and of physiology, 1840, at Leipzig. One of the pioneers in the territory between physiology and psychology, he propounded Weber's law, that the amount of stimulus needed to produce a given sensa-

tion depends on its proportion to the immediately preceding stimulus. He died Jan. 26, 1878.

Webster, BENJAMIN (1864-1947). British actor. Grandson of a well-known actor-manager of the same name (1797-1882), he was born June 2, 1864, and educated at Stationers' school and King's College, Cambridge. A barrister, he gave up the law to join the Hare and Kendal management at the St. James's Theatre, making his debut in *Clancarty*, 1887. He was associated with Irving and Alexander, and toured with Ellen Terry in 1898. He played the caliph in the original *Chu-Chin-Chow*.



Ben Webster,
British actor

Later memorable performances were in *Symphony in Two Flats*, 1929; *Richard of Bordeaux*, 1933. He married May Whitty (q.v.) in 1892, and their daughter Margaret Webster (b. 1905) became an actress and producer in New York. Ben Webster, who was also in films, e.g. *The Old Curiosity Shop*, and *Drake of England*, died in Los Angeles, Feb. 26, 1947.

Webster, DANIEL (1782-1852). American orator, statesman, and lawyer. Born at Salisbury (Frank-



Daniel Webster,
American orator

lin), N.H., Jan. 18, 1782, he was called to the bar in 1803. He sat in the house of representatives, 1813-17 and 1823-27, and was senator, 1827-41 and 1845-50. In

1816 he set up in practice as a lawyer in Boston. At first an opponent of protection, he afterwards supported the high tariff called the tariff of abominations. He failed thrice to secure the Whig nomination for the presidency. Refusing the vice-presidency, he held the secretaryship of state, 1841-43 and 1850-52. Although opposed to the war with Mexico and the extension of slavery, he regarded the latter as preferable to endangering the Union. In 1852 he retired to Marshfield, Mass., where he died Oct. 24.

In spite of undoubtedly great administrative powers, it is on oratory that Webster's reputation chiefly rests. Among his most

famous speeches were addresses on the bicentenary of the landing of the Pilgrim Fathers at Plymouth, on the deaths of Adams and Jefferson, and on the laying of the foundation and the dedication of the Bunker Hill monument. *Consult* Writings and Speeches, 18 vols., 1903; Lives, S. G. Fisher, 1911; F. A. Ogg, 1914; D. W. as an Economist, R. Carey, 1929.

Webster, JOHN (c. 1580–1625). English dramatist. The son of a London tailor, he became a free-man of the Merchant Taylors' company. He wrote for Henslowe, collaborated with Drayton, Munday, Middleton, Dekker, Heywood, and others, and completed Marston's *The Malcontent* for the stage. His independent work includes a romantic comedy, *The Devil's Law Case*, and three tragedies, *Appius and Virginia*, *The White Devil* (or *Vittoria Corombona*), and *The Duchess of Malfi*. The last two show Webster as a conscientious craftsman, a master of pathos and the portrayal of gloom, grisly horror, and sardonic humour. He raised melodrama almost to the pitch of tragedy, and touched it with lyric beauty in some of the most moving dirges in the language; but he was without humour and his plots lack unity of action and his characters consistency.

The best edition of his Works is by F. L. Lucas, 1927; E. E. Stoll produced a *Life*, 1905; *consult* also J. W. and the Elizabethan Drama, R. Brooke, 1913.

Webster, JULIA AUGUSTA (1837–94). British poet. Born at Poole, Dorset, daughter of Vice-



Julia Webster,
British poet

Admiral George Davies, she married in 1863 Thomas Webster, fellow of Trinity, Cambridge. Her works include translations from the Greek tragedians, *Dramatic Studies*, 1866; *Portraits*, 1870; and *A Book of Rhyme*, 1881, modelled on Italian peasant songs. She also wrote the poetical dramas, *The Auspicious Day*, 1872; *Disguises*, 1879; and *The Sentence*, 1887, perhaps her best work. She died Sept. 5, 1894.

Webster, NOAH (1758–1843). American lexicographer. Born at Hartford, Conn., Oct. 16, 1758, he was educated at Harvard. He became a teacher and political pamphleteer, but also found time

to study law and write books. The success of his *Grammatical Institute of the English Language*, 1783–85, and other works on grammar, led him to project the great *American Dictionary*, of which the first of many editions appeared in 1828. Webster died May 2, 1843.

Webster, TOM (b. 1890). British cartoonist. Born July 17, 1890, at Wolverhampton, and there educated, he first published work in the *Birmingham Weekly Post*, which offered a weekly prize for a humorous drawing. After four years as sporting cartoonist on the *Birmingham Sports Argus*, Webster joined *The Daily Citizen* as political cartoonist. From 1919 to 1940 his sports cartoons and caricatures of sporting personalities appeared regularly in the *Daily Mail*. From 1944 he worked for *Kemsley newspapers*. Webster's popular drawings were collected and published annually.

Weddell Sea. Bay of Antarctica. It lies S. of the Atlantic Ocean between Hearst Land on the W. and Coats Land on the E. Bruce, Morrell, Filchner, Weddell, and Shackleton contributed to the still incomplete knowledge of its coasts and waters. In 1915 the *Endurance* was crushed and sunk in the N.W. corner.

Wedding Anniversaries. The best-known of these, with the presents traditionally regarded as acceptable, are mentioned under *Golden Wedding*.

Wedding Rites. Ceremonial observances attending entry upon matrimony. They often embody survivals of primitive custom. There may be meal communion, mutual feeding with rice, mutual drinking of clam-broth or saki, breast-sprinkling with bullock-blood, head-sprinkling with coconut milk, and forehead-marking with water, and forehead-marking with blood, or symbolically with vermilion. The bridegroom may wear a hat woven from ancestral hair, as in Korea. The rite may be preceded by an exhibition of prowess, such as capturing a bullock or cutting a tree. Placation of spirits, or mutual worship of ancestors, may be obligatory, as in Annam. When some Hindus marry into a lower caste they are represented at the ceremony by an inanimate proxy. In some castes the binding rite consists in hand-tying with a turmeric-dyed thread.

The bride may wash the bridegroom's feet, or be carried across the bridegroom's threshold, or

carry fire to her husband's hut or have her ears boxed by the bridegroom. The bridal pair may walk round the family altar, the custom in ancient Rome, or round the house pillar; the bride may pass thrice round the hearth. The normal Hindu token is a neck-pendant, retained by Christian converts; crowns are placed upon the head. The Roman betrothal ring passed into the wedding ring of Christendom. *See* Marriage.

Wedekind, FRANK (1864–1918). German dramatist. Born at Hanover, July 24, 1864, he studied law, and, turning to literature and the drama, lived chiefly in Munich. The harsh satire and often repulsive realism of his plays roused controversy, and Wedekind was for a time imprisoned for *lèse-majesté*. Among his works, in many of which is seen the influence of the Scandinavian dramatists, are *Frühlings Erwachen*, 1891; *Der Erdgeist*, 1895; *Der Kammersänger*, 1899; *Der Marquis von Keith*, 1904; *Totentanz*, 1906; *Bismarck*, 1916; *Herakles*, 1917; *Überführtenichts*, 1918. He died in Munich, March 4, 1918.

Wedge. One of the simple mechanical powers, in effect a double inclined plane. The power is applied at right angles to the base of the wedge, and the resistance of the material which is to be divided acts as a pressure on the two faces. *See* Masonry; Plane.

Wedge. In meteorology, a ridge of high pressure which frequently develops between two depressions, the shape of the isobars resembling a V with a rounded point directed usually, in the N. hemisphere, towards the north. As the first depression retreats pressure rises, but as the second advances it begins to fall. The weather in the front and central zones is often brilliant, but deteriorates in the rear, and rain frequently follows. Rapid clearing of the weather after the passage of a depression may thus indicate that a wedge has formed, and the period of comparatively fine weather will be perhaps only a few hours. The opposite effect is termed a trough of low pressure.

Wedge Furnace. Type of roasting furnace widely used in the treatment of ores during the extraction of non-ferrous metals. Often it is necessary to remove sulphur from an ore, and this is done by heating in air. Good roasting may be effected in multiple-hearth roasters, of which the wedge furnace is typical. This has a series of circular hearths

placed one above the other with a rotating air-cooled rabbling arm above each. The ore is dropped on to the top hearth and rabbled across it until it falls through a hole on to the next hearth, where the process is repeated. The ore travels across each successive hearth to the bottom, while a current of gases travels in the opposite direction, burning the sulphur as it comes into contact. *See Roasting; Roasting Furnace.*

Wedgwood, JOSIAH CLEMENT WEDGWOOD, 1ST BARON (1872-1943). British politician. Born



1st Baron Wedgwood, British politician

March 16, 1872, a descendant of the famous potter, he was educated at Clifton and the R.N.C., Greenwich. Assistant constructor in Portsmouth dock yard, 1895-96, he was a naval architect in Elswick shipyard, 1896-1900. He served in the S. African War, and then was two years a resident magistrate in the Transvaal. Wedgwood was Liberal M.P. for Newcastle-under-Lyme from 1906 continuously. He was a foremost advocate of the taxation of land values. In the First Great War he was a sub-lieut. in the R.N.D., rendered special services with the armoured car section in Belgium, was in 1917 assistant director of trench warfare, and in 1918 went to Siberia as a colonel. Then he joined the Labour party, and was chancellor of the duchy of Lancaster in 1924. Chairman of the commons records committee from 1929, he planned and himself wrote two vols. of a history of parliament. He also wrote on his ancestors' industry, and *Memoirs of a Fighting Life*, 1940. Raised to the peerage in 1942, he died July 26 next year, the title going to his son Francis (b. Jan. 20, 1898).

Wedgwood, JOSIAH (1730-95). British potter. Born at Burslem, July 12, 1730, he was apprenticed to his brother Thomas, and as partner of Thomas Whieldon of Fenton produced the melon and cabbage patterns of earthenware. He



Jos. Wedgwood
After a bust by J. Flaxman

became a master-potter at Burslem, 1759, was appointed queen's potter, 1762, and opened the great Etruria works in 1769. He raised ornamental pottery to the status of a fine art and introduced many technical improvements. Wedgwood employed Flaxman and accepted designs by Reynolds, Roubillac, and Stubbs. He was elected to the Royal Society in 1783, to the Society of Antiquaries in 1786, and died at Etruria Hall, Jan. 3, 1795. *See Burslem; Pottery; Wedgwood Ware. Consult J. W. and His Pottery, W. Burton, 1922.*

Wedgwood Ware. Artistic earthenware and porcelain produced by Josiah Wedgwood at Burslem and Etruria, Staffs, and made since his time at the Etruria potteries, later at Barlaston. At Burslem, Wedgwood made green glaze and cream-coloured ware with fine and light body and brilliant glaze, known as Queen's ware. At Etruria, Wedgwood imitated Greek and Etruscan vases, employing Flaxman and other artists to design the figures. He made black basalt as well as cream ware and invented the beautiful jasper ware by which he is best known. Other kinds were pierced cream-coloured basket ware, fine red pottery, and silvery lustre ware. Lavender ware was made in 1850, and later decorated with white slip. Golden and red copper lustres have been used. Porcelain was manufactured at Etruria, 1809-15, and again after 1870, and to this class of



Wedgwood Ware. Vase made at the Wedgwood pottery works, Barlaston, Stoke-on-Trent

pottery Chinese powder-blue has been applied. *See Etruria; Jasper; Majolica; Pottery; Toby Jug.*

Wedmore. Village of Somerset, England. It is 8 m. W. of Wells, and gives its name to a treaty made between Alfred the Great and the Danes in 878. At Ethandune Alfred defeated the Danes, who sued for peace, terms being arranged at Chippenham. The arrangement which divided England between the English and the Danes, although sometimes associated with Wedmore, was

really made some years later. *See Danelagh; English History.*

Wedmore, SIR FREDERICK (1844-1921). British art critic and novelist. Born at Clifton, July 9, 1844, and educated at Weston-super-Mare, Lausanne, and Paris, he became a journalist and art critic for *The Standard*. He lectured widely in Great Britain, and in the U.S.A. in 1885. Among his many works are *Studies in English Art, 1876; Four Masters of Etching, 1883; Méryon, 1889; Life of Balzac, 1890; Whistler and Others, 1904; Painters and Painting, 1913. Pastorals of France, 1877*, was a novel of French provincial life, and *Orgeas and Miradou, 1896*, a volume of delicate short stories. Other novels were *The Collapse of the Penitent, 1900*, and *Brenda Walks On, 1916*. Sir Frederick published his *Memories* in 1912, the year he was knighted, and died Feb. 25, 1921.

Wednesbury. Mun. bor. and market town of Staffs, England. In the heart of an industrial district 8 m. N.W. of Birmingham and 121 m. from London, it is on two rlys., while town and neighbourhood are served by bus. The parish church of S. Bartholomew occupies the site of a temple of Woden, from whom the town takes its name, and is a Perpendicular building. Other edifices include the town hall, art gallery, and public library. The principal manufactures are rails, boiler-plates, steel, iron, wrought iron, and tools, while constructional engineering is carried on. Wednesbury was made a borough in 1886, and has sent a member to parliament since 1867. Market days, Fri. and Sat. Pop. 33,690.

Wednesday. Fourth day of the week. The name comes from the A.S. god Woden. The Romans identified Woden with Mercury, and called Wednesday *Dies Mercurii* (day of Mercury), whence the French *mercredi*. *See Ash Wednesday; Sheffield Wednesday.*

Wednesfield. Urban dist. and town in the parl. bor. of Wolverhampton, Staffs. It takes its name from the A.S. god Woden and is historically interesting as the site of a battle fought in 910, when Edward the Elder drove back the Danish settlers who had rebelled against him. Wednesfield is now the centre of the



Wednesbury arms

lock and key industry, and makes steel tubes, sheet metal, and traps for vermin. It has a rly. station. The old pron. of Wedgfield is dying out. Pop. 16,880.

Weed. Name given by the farmer or gardener to a plant which interferes with cultivated crops. Weeds are plants out of place, and, like other plants, are propagated principally by seeds. Thistles, dandelions, etc., have seed which fly through the air, and are thus spread over large areas. Other seeds are washed into rivers during heavy rains or floods, and so may be carried far; while man himself is responsible for the spread of some through the sale and planting of commercial seeds which are contaminated by weed seeds. Some weeds are extremely difficult to exterminate. The seeds of charlock, for instance, may be buried deep in the soil for many years, yet will germinate when brought to the surface. The most troublesome weeds are perennials, such as couch grass, which constantly invades new ground by means of its creeping underground stem.

The losses caused to agriculture by weeds are very much heavier than imagined. Yellow mustard, charlock, and runch cut wheat crops in many districts by 30 to 50 p.c. Garlic-mustard and chamomile affect stock, giving milk and butter an unpleasant taste. Meadow saffron is actually poisonous, and kills outright animals that browse upon it. Many weeds, again, act as hosts to fungi, which cause some of the worst diseases in crops. In this way charlock becomes the cause of the finger and toe disease in turnips, while shepherd's purse is the source of the infection of white rust in cabbages.

Various chemicals are used by gardeners and horticulturists for killing weeds. Some, e.g. arsenic, are poisonous; others, e.g. ammonium sulphate, are comparatively harmless. Sodium chlorate is regarded as a most effective non-poisonous weed-killer for thistles as well as many germinaceous weeds; it is particularly useful for destroying weeds in garden paths. Tar is effective in freeing paths and roads from weeds. Weed control by selective action is now practised on a large scale. The chemical used is the sodium salt of 4-chlor-2-methylphenoxyacetic acid, by which charlock, wild radish, pennygrass, corn buttercup, and fat hen can be eliminated from cereal crops.

Weedon. Village and parish of Northants, England. Situated on the A6 road and the main rly to Rugby, 8 m. W. of Northampton, it has a sub-depot of the Royal Army Ordnance Corps, with barracks and buildings for a large quantity of stores. The royal pavilion, subsequently used as an officers' mess, was built for George III. Pop. 1,753.

Week. Period of seven days, a sub-division of the month. Probably it was based on the four phases of the moon, each of which approximates to seven days; but it has also been suggested that the number seven was derived from the sun and moon and the five planets. The Egyptians named the days of their week after the planets, and this nomenclature spread to the Greeks and Romans, and thence to the Teutonic and Celtic peoples. The origins of the English names of each day of the week are described separately. The seven-day week has not always been universal. Five-, six-, and eight-day weeks exist in Africa, based on market days; the Greeks originally had a month divided into three decades and the Romans an eight-day week; and the French Revolutionary calendar had months in three ten-day sections. See Calendar.

Weeks, FESTIVAL OF. Jewish festival (Lev. 23, vv. 15-21). Held at the conclusion of seven weeks (i.e. a week of weeks) after the opening of Passover (q.v.), and called in Greek Pentecost (q.v.), it is also known as the Feast of Harvest (Ex. 23, v. 16). See Whitsunday.

Weem (Gael. cave). Primitive underground structure of the early metallic age in Scotland. A type of earth-house (q.v.), weems are distinguishable from surface erections beneath artificial mounds. They are sometimes called Picts' Houses (q.v.). Weem is the name of a village near Aberfeldy, Perthshire.

Wee MacGregor. Character in a story of the same name by J. J. Bell, first published in 1902. He is a small Glasgow boy ever asking questions and getting into childish scrapes. He and his family form a delightfully natural group.

Weenen. Village and district headquarters of Natal, South Africa. It is 29 m. by rly. N.E. of Estcourt, at an alt. of 2,940 ft. In the vicinity many Boers and their families, estimated to total 347 souls, were massacred by the Zulus under Dingaan, Feb. 6, 1838. The neighbourhood was later given

its name of Weenen (weeping). The Zulus being defeated, the village was settled in 1839, the second oldest in Natal.

Weever (*Trachinus*). Genus of marine fish, of which two species occur around the British coasts.



Weever. The larger species of the British fish, *Trachinus draco*

The greater weever (*T. draco*) is about a foot long; while the lesser weever (*T. vipera*) is just half as large. They are popularly known as Sting Bulls, from the numerous spines on the back, which are capable of inflicting a poisoned wound.

Weevil. Name given to beetles of the family Curculionidae, numbering about 40,000 known species, of which 450 kinds occur in Great Britain. They are easily recognized by the shape of the head, which is prolonged into a beak or rostrum bearing the mouth-parts at its extremity. In some species, such as the nut weevils, this is very long and slender. The antennae are elbowed and usually end in a club. Weevils and their larvae, being vegetable feeders, are often great pests of the farmer and horticulturist. The granary weevil (*Calandra granaria*) and the rice weevil (*C. oryzae*) are almost cosmopolitan; the Mexican cotton boll weevil (*Anthonomus grandis*) is highly destructive to the cotton crop in the U.S.A., while the apple blossom weevil (*A. pomorum*) and the pine weevil (*Hyllobius abietis*) are notable pests. Species of *Apron* and *Sitona* attack leguminous crops, and *Ceuthorynchus pleurostigma* is the cabbage gall weevil known to gardeners. See Beetle.

Weft. Name for the transverse threads in woven cloth. See Weaving.

Wegg, SILAS. Character in Dickens's novel *Our Mutual Friend*. A wooden-legged ballad-monger and fruit-stall proprietor, he is engaged by Mr. Boffin to read aloud Gibbon's *Decline and Fall*, and attempts blackmail without success. He has a trick of using snatches of ballads in his conversation, the words slightly amended to suit the occasion.

Wehberg, HANS (b. 1885). German jurist, born Dec. 15, 1885, at Düsseldorf. After studying at Jena, Göttingen, and Bonn, he became an assistant judge, and was released from war service in 1917

to work at Kiel university. In 1919 he was legal adviser of the German League of Nations union; in 1921 of the Reichstag committee investigating the causes of the First Great War. Like his teacher Walther Schücking, Wehberg had become an active pacifist even during the war, and was a protagonist of the League from the beginning. They published together in 1921 the standard work on the covenant of the League. From 1928 Wehberg was at Geneva university institute of international studies as professor of international law.

Wehrmacht (Ger., defence power). Term officially adopted under the Nazi regime for the German armed forces, Reichswehr (empire defence) being the term used for the republican professional army of 100,000 and small navy. The Wehrmacht comprised all regular units of the army, the navy rebuilt under the 1935 naval agreement with Great Britain, and the Luftwaffe (air weapon) created 1933-39 in contravention of the treaty of Versailles. The Wehrmacht was disbanded and proclaimed illegal, and its reconstitution under any guise forbidden, by the Allied control council Aug. 29, 1946.

Wei Chi (encircle piece). Ancient Chinese game for two. Traditionally supposed to have been invented before 2000 B.C., it is mentioned by Confucius. It is played on a square board with 19 parallel lines running in each direction to form 361 intersections on which, in the course of play, stones or pieces are placed by the antagonists, white and black alternately. The object of each player is to occupy the largest possible territory with the fewest stones of

his own colour. No stone is moved once it has been placed, except to be taken off the board if completely surrounded by the opponent's stones, having no contact vertically or horizontally with another stone of its own colour. It follows that no stone may be placed in territory entirely surrounded by the enemy. Tournaments have been held for centuries in China, and the game has found favour in Japan. The simplest of games to describe, Wei Chi is one of the most mentally exacting to play.

Weighing Machine. Apparatus for ascertaining the weight of an object. The term thus includes such appliances as the common balance, spring balance, and steelyard; but applies more particularly to (1) larger apparatus such as the weighbridge and similar machines (e.g. for weighing cattle at markets); and (2) indicating machines for weighing commodities in retail shops.

A diagram of a weighbridge is given: the loaded vehicle (of which the tare or unloaded weight is known) is run on to the platform, and the weight of the load is registered through a system of levers—either directly on a dial or by means of a subsidiary appliance of the steelyard type. In the second class of machine the weight is shown directly on a clock-face dial or on a drum which passes an opening in the casing. To obtain something like a dead-beat action, some form of damper is included in the mechanism to cancel out excessive vibrations of the pendulum or other main moving parts.

of the appropriate coin permits the recording or indicating mechanism to operate; weighing is done in the act of stepping on to the platform. In simple machines the weight of the user, acting through the platform, supplies the power to work the appliance. Machines which issue a printed ticket, or even announce one's weight, are operated by electric motors switched on by inserting the coin. In many factories manufacturing or packing foodstuffs, drugs, etc., automatic machines weigh the products and apply checks if short weight is registered, or bring the filling or packing machines to a stop by electronic devices.

Weights and Measures. Standards of magnitude, weight, and value. Early weights and measures were based upon natural measures of length, e.g. the cubit, the length from the elbow to the tip of the longest finger, and varied within wide limits. A cubit, for example, might be anything from 18 to nearly 21 ins. Many earlier measures of volume and weight were haphazard, not even depending upon such natural measures as the cubit. In the 12th century in England a grain of wheat or barley was taken as a standard of weight; on the Continent, as late as the 18th century, every little principality had its own measures.

The advantages of standardising weights and measures were early realized, however. Such standards were in force in the Roman empire, the actual standards from which others were derived being kept in a Roman temple. In England Saxon standards were kept at Winchester, and after the Norman conquest at Westminster. In the 13th century it was enacted that 3 barleycorns should be reckoned as 1 inch, 12 ins. 1 ft., 3 ft. one ell, and 5½ ells 1 perch.

All the weights and measures which have become slowly standardised through centuries suffer from having subdivisions or multiples which do not lend themselves to easy calculation, e.g. 12 ins. to a foot, 112 lb. in a hundredweight, etc. The sole advantage of this duodecimal basis is that 12 is a multiple of 4 and 3. The introduction of the metric system (*q.v.*) has so simplified calculations and connected linear, square, and cubic measures in a logical way, that it has been made the legal system in many countries.

In Great Britain the legal unit of length is the yard; of weight, the pound; and of volume, the gallon.



Weighing Machine. Diagram of an automatic weighbridge which records the weight of a load on a ticket. Top picture shows the weighing of a lorry

Automatic weighing machines for giving the weight of a person range from small platform machines in a bedroom or bathroom to the familiar appliances at railway stations. In the coin-operated machines, insertion

The yard is defined as the distance between central hairlines on each of two gold plugs sunk into a bar of iridio-platinum in the custody of the standards department of the board of trade. Copies of the bar exist in a number of towns. The standard avoirdupois pound is one of 7,000 grains, the Troy pound 5,760 grains; the former being related to the standard yard by the fact that 1 cu. ft. of distilled water at standard temperature and pressure weighs 62·321 lb. avoird. The standard pound is a cylindrical-shaped piece of platinum kept at the board of trade. Length and weight are fixed at a temp. of 62° F. in air with a barometric pressure of 30 ins. at sea level. Existing British standards of length being subject to slight variations due to the natural shrinkage of metal, experiments have been made at the National Physical Laboratory to establish an immutable standard of length based upon the wavelength of light emitted by a cadmium filament.

The gallon is the volume occupied by 10 lb. of distilled water at 62° F. and 30 ins. barometric pressure, and is equal to 277·274 cu. ins. From the yard, pound, and gallon all other divisions and multiples in use, *e.g.* the inch, ounce, pint, etc., are derived. The chief British weights and measures are:

MEASURES OF LENGTH.

12 inches	= 1 foot.
3 feet	= 1 yard.
5½ yards	= 1 rod, pole or perch.
40 poles	= 1 furlong.
8 furlongs	= 1 mile.
100 links	= surveyor's chain.
	= 22 yards.
6 feet	= 1 fathom.
608 feet	= 1 cable.
10 cables	= 1 admiralty mile.
6,082·66 feet	= 1 nautical mile.

MEASURES OF AREA.

144 sq. inches	= 1 sq. foot.
9 sq. feet	= 1 sq. yard.
30¼ sq. yards	= 1 sq. pole.
40 sq. poles	= 1 rood.
4 roods	= 1 acre.
10 sq. chains	= 1 acre.
640 acres	= 1 sq. mile.

MEASURES OF CAPACITY.

Cubic Measure.

1,728 cubic inches	= 1 cubic foot.
27 cubic feet	= 1 cubic yard.

Dry Measure.

4 galls	= 1 pint.
2 pints	= 1 quart.
4 quarts	= 1 gallon.
2 gallons	= 1 peck.
4 pecks	= 1 bushel.
8 bushels	= 1 quarter.
36 bushels	= 1 chaldron.

There are a number of local bushels. A bushel of English wheat is 60 lb., of foreign wheat 62 lb., of English barley 50 lb., oats 39 lb., rye and maize 60 lb.

Wine Measure.

2 pints	= 1 quart.
4 quarts	= 1 gallon.
42 gallons	= 1 tierce.
1½ tierces	= 1 hogshead.
1½ hogsheads	= 1 puncheon
1½ puncheons	= 1 pipe.
2 pipes	= 1 tun.

1 hogshead of claret=46 gallons;
1 butt of sherry=108 gallons; 1
pipe of port=115 gallons; of
madeira=92 gallons; 1 hogshead
of brandy=45-55 gallons, usually
46 gallons. An anker=10 gallons.
A bottle of wine usually contains
about one-sixth of a gallon.

Ale and Beer Measure.

4 gills	= 1 pint.
2 pints	= 1 quart.
4 quarts	= 1 gallon.
9 gallons	= 1 firkin.
2 firkins	= 1 kilderkin.
2 kilderkins	= 1 barrel.
1½ barrels	= 1 hogshead.
1½ hogsheads	= 1 butt.
2 butts	= 1 tun.

MEASURES OF WEIGHT.

Avoirdupois Weight.

16 drams	= 1 ounce.
16 oz.	= 1 pound.
14 lb.	= 1 stone.
2 stones	= 1 quarter.
4 quarters	= 1 hundredweight.
20 cwt.	= 1 ton.
7,000 grains	= 1 pound.
437½ grains	= 1 ounce.
1 cental	= 100 pound.

Troy Weight.

24 grains	= 1 pennyweight.
20 pennyweights	= 1 ounce.
12 ounces	= 1 pound.
5,760 grains	= 1 pound.

The Troy pound is not now used.

Apothecaries' Weight.

20 grains or minims	= 1 scruple.
3 scruples	= 1 drachm.
8 drachms	= 1 ounce.
12 ounces	= 1 pound.

Apothecaries' Liquid Measure.

60 minims	= 1 fluid drachm.
8 fluid drachms	= 1 fluid ounce.
20 fluid ounces	= 1 pint.

A drop is practically a minim. The corbyn, containing 40 fluid ounces, and the Winchester quart of 80 fluid ounces, are two standard bottles used in the drug trade.

Jewel Measures.

1 metric carat = 200 milligrams, is the standard used.

The London, Paris, and Amsterdam carat weighs 3·163 grains; the South African carat 3·174 grains. For diamond and pearl weights an ounce troy is often taken as 151½ carats. For gold and silver 240 grains=1 carat, and 24 carats = 1 lb.

Fish Weight.

1 barrel (anchovies)	= 80 lb.
1 quintal	= 112 lb.
4 fish	= 1 warp.
33 warps	= 1 long hundred.
10 long hundreds	= 1 thousand.

10 thousand	= 1 last.
37½ gallons	= 1 cran of fresh herrings.
26½ gallons	= 1 barrel of cured herrings.

PAPER MEASURES.

Writing Paper.

24 sheets	= 1 quire.
20 quires	= 1 ream.

Printing Paper.

516 sheets	= 1 ream.
2 reams	= 1 bundle.
5 bundles	= 1 bale.

The following are special measures in use for different articles:

Cocoa (bag)	= 1 cwt.
Coffee (bag)	= 1½-1¾ cwt.
Cotton (bale) American	= 400-500 lb.
Egyptian	= 700-740 lb.
Indian	= 500-600 lb.
Flour (peck)	= 14 lb.
Flour (sack)	= 280 lb.
Glass (stone)	= 5 lb.
Gunpowder (barrel)	= 100 lb.
Meat (butcher's stone)	= 8 lb.
Tar (barrel)	= 25 gallons.
Tobacco (hogshead)	= 12-18 cwt.
Wood (cord)	= 128 cubic ft.
Firkin of butter	= 56 lb.
Firkin of soap	= 64 lb.
Last of pitch	= 14 barrels.
Last of wool	= 12 sacks.
Mineral oil (barrel)	= ½ metric ton.
Sack of wool	= 364 lb.
Load of earth	= 1 cubic yard.
Load of hay or straw	= 36 trusses.
Rice (bag)	= 168 lb.
Sago (bag)	= 112 lb.
Biscuits (bag)	= 102 lb.
Sugar (bag)	= 224 lb.
Gold (bar, mint)	= 400 oz. troy
Silver (bar, mint)	= 1,000-1,100 oz. troy

British weights and measures are governed under various Acts. The Weights and Measures Act, 1878, bases all legal measures on the standard yard and pound, the gallon being based in turn on the latter. Under the Act the divisions of the inch by the Birmingham gauge became standard after Nov. 1, 1914. In Great Britain contracts expressed in weights and measures other than the imperial are in general void. The metric weights and measures may be void in contracts relative to foreign trade.

Certain trades in the United Kingdom have legal measures of their own, *e.g.* the cran for herrings sold by weight.

FOREIGN WEIGHTS AND MEASURES. The metric system has been adopted by most European countries and many in Asia. In addition many countries still use many of their own historical weights and measures locally, though they have seldom been standardised. Australia, New Zealand, and S. Africa use the British system, but in Canada both the British and metric systems are used. In the U.S.A. weights and measures are the same as those in the U.K., except that the short ton of 2,000 lb. and the long ton, 2,240 lb., are both in use, and the cental of 100

lb. The measures of capacity are the old Winchester measures.

See under the names of various weights and measures, coins, etc.; Coinage; Metric System. Consult Outlines of the Evolution of Weights and Measures of the Metric System, Hallock and Wade, 1906; Law Relating to Weights and Measures, G. A. Owen, 1947.

Weihaiwei. Former British colony in China. It is situated on the N. coast of the promontory in the E. of Shantung province. The territory, which was leased to Great Britain by China in 1898, comprised Weihaiwei city, the island of Liukung, all the islands in the Bay of Weihaiwei, and a belt of land 10 m. wide along the coastline. The total area was 285 sq. m. In addition to the leased territory there was a sphere of influence which comprised that portion of Shantung lying E. of the meridian of 121° 40', an area of 1,500 sq. m. The territory was administered from Port Edward by a commissioner. The bay was used as a naval base and summer exercising ground for the China squadron. As a result of the Washington conference in 1922, Weihaiwei was handed back to China. The native city is walled, and the territory supports farmers and fishermen. Pop. 178,915.

Wei-ho. River of China in Kansu and Shensi provs. It rises W. of Kungchangfu, and flows almost due E., past Sianfu, to join the Hwang-ho, of which it is the longest affluent, at the great bend.

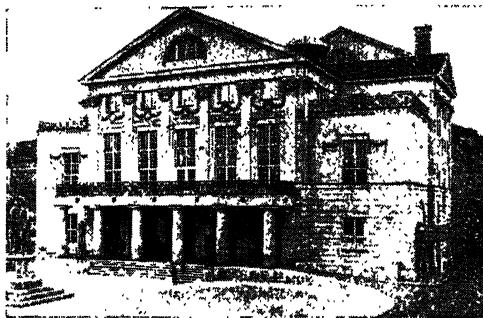
Weimar. A town of Central Germany. Until 1918 it was capital of the grand duchy of Saxe-



Weimar arms

Weimar-Eisenach; then of Thuringia. Situated 13 m. E. of Erfurt, on a height of about 720 ft. at the foot of the Ettersberg, and on the river Ilm; it is a junction on the Berlin-Frankfurt rly., and had an airport. Industry included engineering, vehicle building, shoe and textile factories, and seed growing, but in the main Weimar preserved its character as a place for residents and tourists. Pop. approx. 67,000.

The town church of SS. Peter and Paul (1499, renewed 18th cent.) where Bach played the organ and Herder preached, contains the tombs of former rulers, and that of the elder Lucas Cranach, whose altar-piece is one of his great works. In the court church



Weimar, Germany. The National Theatre, showing the Goethe and Schiller monument on the left

(1713) Goethe's wife is buried, while he and Schiller rest with the grand dukes in the dynastic mausoleum. The palace (1790-1803), two old castles, now government buildings, and the library (1563, restored 1760) deserve mention. The main interest, however, is in buildings connected with Goethe (*q.v.*); his own house is preserved as a museum. Less ambitious houses and museums are devoted to Schiller and Liszt. The national theatre, with the Goethe-Schiller monument in front, was in 1919 the seat of the assembly which created the Weimar republic (*v.i.*). There are also a valuable museum with fine medieval and Renaissance paintings, a modern art museum, and the Goethe-Schiller archives containing, apart from works and letters of these two, those of many important men of their time and the 19th cent. Weimar has long been the home of learned and art societies, colleges, and schools.

Known since 975, it received urban rights in 1253, and from the 15th century was the residence of rulers. These in the 18th and 19th centuries made it a centre of German spiritual and artistic life and its name synonymous with all that was opposite to Potsdam. Charles Augustus (1758-1828), the Maecenas of Goethe, Schiller, Wieland, and Herder, was the best-known ruler. During the Second Great War Weimar was surrendered by the burgomaster to U.S. forces without opposition April 12, 1945. After Germany's surrender it lay in the Russian zone of occupation. *Pron.* Vi-mar.

Weimar Republic. Colloquial term for the German Reich under the democratic parl. govt. and republican constitution which existed from William II's flight to the Netherlands, Nov. 10, 1918, until Jan. 30, 1933, when Hitler, appointed under that constitu-

tion chancellor of a coalition govt., started to abolish the regime. The name is used more frequently abroad than in Germany; it is derived from the fact that a national assembly, elected Jan. 19, 1919, sat in the theatre at Weimar for over a year, apart from a short interlude

at Berlin, and there approved the constitution on Aug. 11.

Weingartner, (PAUL) FELIX (1863-1942). Austrian conductor, composer, and writer. Born at Zara, Dalmatia, June 2, 1863, he studied at Graz and Leipzig, and at Weimar enjoyed the friendship of Liszt. Here his first opera *Sakuntala* was produced in 1884, followed by six others which had some success in Germany. He

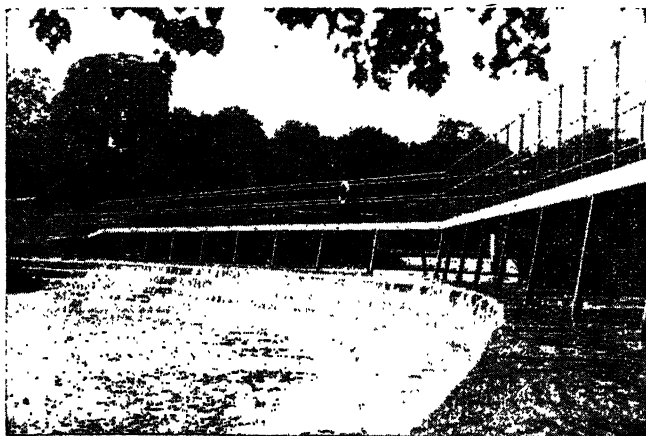


Felix Weingartner, Austrian conductor

was an able pianist, often accompanying singers of his own works. He made his debut as conductor in London in 1898, and in 1906 introduced at a Philharmonic

concert the first of his five symphonies. Next year he succeeded Mahler as musical director at the Vienna opera. Director of the early Mozart performances at Salzburg, he continued to take part in festivals there until 1937. From 1905 he frequently visited the U.S.A. An outstanding conductor, especially of Beethoven, he also did much to initiate a revival of Berlioz, collecting that composer's works in collaboration with Charles Malherbe. Weingartner wrote libretti, poems, books on musical problems, and in 1929 his reminiscences (Eng. trans., Buffets and Rewards, 1937). He died at Winterthur, Switzerland, May 7, 1942.

Weir (A. S. *wer*, from *werian*, to defend). Structure for impounding or diverting water, over which flood waters are made to flow without endangering it. Weirs are usually built across rivers or water courses to divert the flow into a canal, while permitting surplus water to pass down the river channel. In designing dams, weirs allow for the safe discharge



Weir. The weir at Pangbourne, on the upper reaches of the Thames

of flood water which might destroy embankments or erode foundations. A closed weir is built solidly across the river, but an open weir usually has piers at intervals between which are movable weirs so built that the height of water is under control. The weir must be designed to deal with the maximum expected flood; where sudden floods may occur, it needs gates that open automatically. Masonry weirs, when possible, are built on solid foundations, but if rock is not available near the surface, piling or cut-off trenches are resorted to.

In hydraulics, weirs measure the flow of water. By forming a restriction across a water course, and introducing a properly made weir, usually of metal with a rectangular or V-shaped notch, the flow can be calculated by measuring the depth of water passing over the notch.

Weir, WILLIAM DOUGLAS WEIR, 1st VISCOUNT (b. 1877). British business man and politician. He was born May 12, 1877, and in youth joined the family business of G. and J. Weir, Glasgow engineers, eventually becoming chairman. During the



Viscount Weir, British engineer

First Great War he occupied posts in the ministry of Munitions, and in 1918 was Air minister, being made a baron. In 1925 Weir advanced a scheme for easily built steel houses, the first suggestion for pre-fabricated houses in Great Britain; but the idea was dropped. On the outbreak of the Second

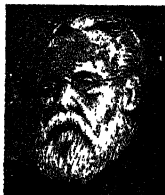
Great War, having been raised to viscount in 1938, he became director-general of explosives, ministry of Supply, and in 1942 chairman of the tank board.

Weir-Mitchell Treatment.

Form of treatment for neurasthenia, originally adopted by an American physician, Dr. S. Weir-Mitchell. It is not now much in favour. The essential features were to guard the patient from every form of worry, to give him complete mental and bodily rest, and to supply him with a superabundance of nourishment. The patient was kept in bed under supervision in a nursing home for a period of from four to five weeks, and was not allowed to receive friends or read newspapers or letters. The cure was much used if nervous disorder had led to physical disorder.

Weismann, AUGUST (1834-1914). German scientist. Born at Frankfort-on-Main, Jan. 17, 1834,

he became a physician at Frankfort, but abandoned practice for the study of zoology, and in 1866 was made professor of zoology at Freiburg. He remained there until 1912 and died in Berlin, Nov. 6, 1914. Weismann's great work was done in the field of evolution. He accepted Darwin's teachings at once, and on them built up the theory that heredity is a question of the continuity of the germ-plasm, that external changes in the life of an individual cannot be transmitted to descendants. These views aroused the opposition of some of Darwin's



August Weismann, German scientist

followers, though not of Darwin himself. Some of his many works have been translated into English, among them *Studies in the Theory of Descent*, 1882; *The Germ-plasm, a Theory of Heredity*, 1893; and *The Evolution Theory*, 1904. See Darwinism; Heredity.

Weissenburg. Town of Bavaria, Germany. It lies on the Swabian Rezat 27 m. S.E. of Ansbach. A free imperial city of the old German empire, it has medieval buildings, and part of its old walls stand. It has varied manufactures. After the Second Great War it lay in the U.S. zone of occupation. Pop. 14,050.

Weissenburg is also the German form of the name of the French town of Wissembourg (*q.v.*).

Weissenfels. Town of E. Germany, in the Land of Saxony-Anhalt. It stands 16 m. S.W. of Leipzig on the right bank of the Saale. There are several churches, including S. Mary's (1303), but the chief building is the former residence of the dukes of Saxe-Weissenfels, a duchy that existed 1556-1746. There were foundries, sugar refineries, shoe factories, tanneries, and machine shops. After the Second Great War it came within the Russian zone of occupation. Pop. 50,000.

Weisshorn. Pyramidal peak of the Pennine Alps, Switzerland. It rises to 14,804 ft., 5 m. N.W. of Zermatt. The first ascent was achieved by Tyndall in 1861. Other Alpine peaks of the same name are the Arosar W. (8,710 ft.), the W. (10,130 ft.) N. of the Flüela Pass, both in Grisons, and the W. (9,875 ft.) in the Bernese Alps S. of Lenk.

Weissmuller, JOHNNY (b. 1904). American swimmer and film actor. He was born at Chicago, June 2, 1904. On April 5, 1927, he swam 100 yds. in 51 secs., a world record, and soon claimed the best times for all distances up to 500 yds., as well as those for 100 and 400 metres in the Olympic games. He became one of the finest exponents of the "crawl." He appeared on the screen in 1932 in *Tarzan the Ape Man*, first of a succession of films in which his prowess as a swimmer was demonstrated. His second marriage, in 1933, was to the film actress Lupe Velez (1910-44).



Johnny Weissmuller, American swimmer and film actor

Weizmann, CHAIM (b. 1874). First president of the republic of Israel. He was born at Motol, Russia, Nov. 27,



Chaim Weizmann,
President of Israel

1874, and educated at Pinsk, and in Germany. A research chemist, he was for a time a lecturer in Geneva and reader in biochemistry at Manchester university, and during the First Great War was in charge of the Admiralty laboratories. An enthusiastic Zionist, he was president of the world Zionist organization, 1921-31 and 1935-46, and in 1932 became chairman of the Jerusalem Hebrew university. On May 16, 1948, he was elected president of the provisional council of Israel, and on Feb. 17, 1949, first president of the republic. His autobiography, *Trial and Error*, appeared the same year.

Welbeck Abbey. Seat of the duke of Portland, in Notts, England. It is 4 m. S.W. of Worksop, and includes 25 acres of fruit and flower gardens and a park, once part of old Sherwood Forest, about 10 m. in circumference. Built on the site of a Premonstratensian abbey, founded in 1154, the house dates for the most part from the 17th century, but the Oxford wing was rebuilt after a fire in 1900. The underground rooms and tunnels, in all about 1½ miles long, were constructed in the time of the 5th duke of Portland, into whose family the estate passed in 1734. In the park is Serpentine Lake, 93½ acres. The duke of Newcastle entertained Charles I at Welbeck in 1633. Some of the buildings, including the underground ballroom, from 1945 housed the No. 2 (Northern Command) formation College, designed to give selected men and women in the army intensive courses of study. See Dukeries; Portland, Duke of.

Welch, JAMES (1865-1917). A British actor. Born at Liverpool, Nov. 6, 1865, he made his first appearance on the London stage in 1887. Welch developed as a successful comedian and made his greatest hit as Sir Guy de Vere in *When Knights Were Bold*, which he brought to London from Nottingham in 1906. In this play he acted continuously until 1911, frequently reviving it and appearing in a silent film version. He died April 11, 1917.



James Welch,
British actor

Welch Fusiliers, ROYAL. Regiment of the British army. Originating in independent companies formed in 1686 for police duties in the Welsh marches, it was taken on to the establishment in 1689 as the 23rd Foot. The regt. served under William III in Ireland, and won its first battle honour at Namur in 1695. With Marlborough it fought at Blenheim, Ramillies, Oudenarde, and Malplaquet. At the end of the Flanders campaign it received the title Prince of Wales's Own Royal Regiment of Welch Fusiliers, commemorated in the central motif of the existing regimental badge.



Welch
Fusiliers
badge

The regt. fought at Dettingen and was one of the select few at Minden. Serving throughout the American War of Independence, it formed part of the army compelled to surrender at Yorktown. Its next action was with Abercromby in Egypt in 1801, and it took part in the capture of the Cape of Good Hope. In the Napoleonic Wars, a second bn. was formed and drafted to the W. Indies, where it won the battle honour Martinique, 1809. The 1st bn. with Moore gained the honour Corunna. Both

bnns. were part of the fusilier bde. at Albuera, and in all won nine Peninsular honours before going on to fight at Waterloo. In the Crimean War, the Royal Welch Fusiliers were at the Alma, Inkerman, and Sevastopol, and in the Indian Mutiny helped to relieve Lucknow. Next followed service in the Ashanti War and the Burma War. The 1st bn. served throughout the S. African War of 1899-1902, and the 2nd was at the relief of Peking in 1900.

Forty-two bnns. were raised for service in the First Great War, when 77 battle honours won included: Marne, 1914; Ypres, 1914, '17, '18; Somme, 1916, '18; Hindenburg Line; Vittorio Veneto; Dorian, 1917, '18; Gallipoli, 1915; Egypt, 1915-17; Gaza; Bagdad. In the Second Great War, the 1st bn. was in France 1939-40, then in Burma; the 2nd took part in Madagascar landings, then joined the 1st; the 4th, 6th, and 7th fought throughout the 1944-45 campaign on the Continent.

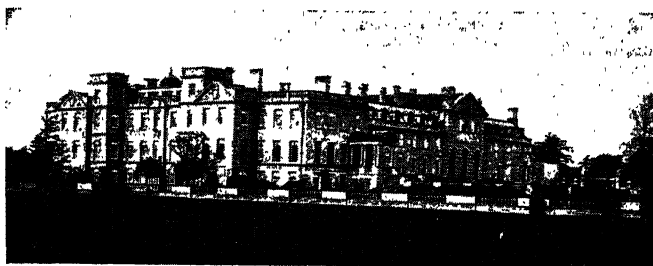
The regimental depot is at Wrexham. All ranks wear the distinctive flash, or bunch of black silk ribbons attached to the back of the tunic or battle-dress blouse collar. This flash is a relic of the period when all soldiers wore greased pigtailed and needed to protect their collars. Through a War office oversight the order to remove pigtailed did not reach the Royal Welch Fusiliers. The flash is not, as often supposed, a mark of mourning for Moore.

Welch Regiment. Unit of the British army. Raised in 1719 from out-pensioners of Chelsea Hospital, it was originally a home defence unit, known as The Invalids, until 1787, when it was reformed as a line regt. (41st Foot). One of its officers was the future duke of Wellington. The first battle honour was gained at Guadeloupe in 1797, and the second during service as marines with Nelson's fleet at St. Vincent. In America there accrued the honours Miami and Detroit. Between 1820 and 1850 the 41st Foot saw service in Burma and Afghanistan.



Welch Regiment
badge

In 1881 the 41st and 69th Foot were amalgamated to form the 1st and 2nd bnns. of the present Welch Regiment. The 69th had been raised in 1756 as the 2nd bn. of the 24th (S. Wales Borderers) Foot, but in 1758 was constituted



Welbeck Abbey, Nottinghamshire. Country seat of the dukes of Portland, built on the site of an ancient abbey, seen from the lake in the grounds

a separate regt. and affiliated to S. Lines. It ranked as marines until converted back to infantry to join Wellington in the Peninsula. It was at Waterloo, and in the Crimean War gained three honours. The Welch Regiment fought throughout the S. African War, and later went on garrison duty on the N.W. Frontier of India.

Thirty-four bns. were raised for the First Great War, and gained the battle honours: Aisne, 1914, '18; Ypres, 1914, '17, '18; Gheluvelt; Somme, 1916, '18; Pilkem; Cambrai, 1917, '18; Macedonia, 1915, '18; Gallipoli, 1915; Palestine, 1917, '18; Mesopotamia, 1916, '18. In the Second Great War, bns. fought in France (1939-40), Italy, and N.W. Europe. The regimental depot is at Cardiff.

Weld, **YELLOW WEED**, OR **DYER'S ROCKET** (*Reseda luteola*). Annual or biennial herb of the family Resedaceae. It is a native of Europe, W. Asia, and N. Africa. It has an erect, smooth, branched stem, 2-3 ft. in height, with slender lance-shaped leaves, and ends in a long, spike-like spray of yellow-green flowers. The fruit is a capsule, open before the black seeds are ripe. Weld was formerly used by dyers to obtain a yellow dye, but this was not sufficiently permanent, though the plant is still the source of the artists' colour Dutch Pink. See Migronette.

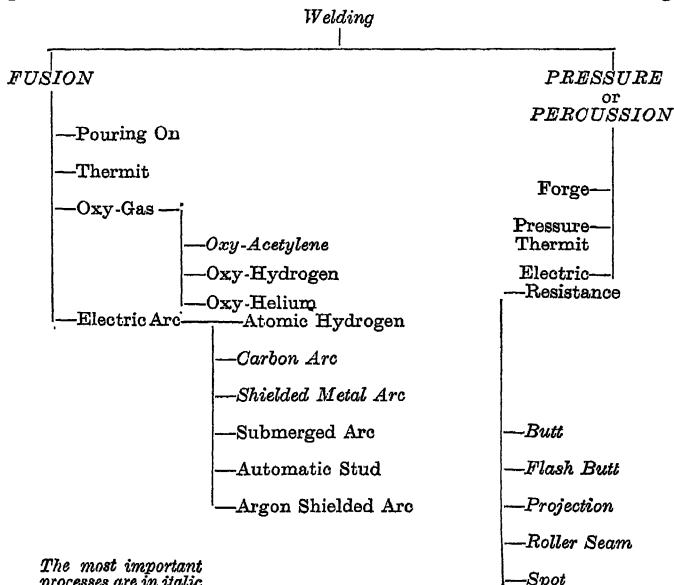
Welding. Process by which two pieces of metal are joined. Both surfaces to be joined have to be raised to a plastic or liquid condition by the application of heat with or without the application of pressure. Though primarily applicable to metals, the term welding is sometimes applied to analogous processes for joining plastic materials. The use of welding greatly increased during the 20th century, becoming, with casting, forging, riveting, and bolting, one of the chief means for fabricating metals, some of which, however, cannot be welded.

Fusion welds are produced by a melting, or melting and casting process; pressure or percussion welds by mechanical pressure with or without melting. The principal processes and their relationships in these groups are indicated in the table in this page.

When similar metals are joined directly into each other, actual alloying or atomic combination of the two metals takes place. As in soldering and brazing, however, a dissimilar metal can be used to form the junction by adhesion with or without some degree of alloying.

In alloying an intermediate solid solution or an inter-metallic compound is formed; but with ad-

formation of a weld. Should the amount of heat required be excessive, or its effect on surrounding



hesion there is a clearly marked separation line between the two metals and the strength of the joint is attained by the hooking up of some of the free atomic linkages which are exposed at the surface of any clean crystal structure such as unoxidised metal. There is also some degree of keying of one metal into the surface irregularities of the other.

The presence of an oxide film on the surface of one or both of the adjoining metal faces is the main hindrance to effective union whether by alloying or adhesion, since this condition prevents that intimate contact between the atomic surfaces which is essential if a good weld is to be made. Various methods are adopted for breaking down these oxide films and carrying them clear of the joint. In most fusion welds a chemical flux is applied to the joint faces either before welding starts or during the process. Such fluxes dissolve the oxides and then float themselves and the products of their action, in the form of slag, to the outer surface of the molten pool. Many of these fluxes and their products are strongly corrosive and need to be removed carefully and as soon as possible after the completion of a weld. Others are extremely tenacious and difficult to remove after solidification.

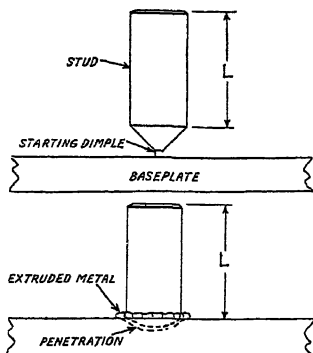
Melting alone, with a flux, is usually sufficient to give the intimacy of contact essential to the

metal structure or finish harmful, or should the cast structure which is produced be undesirable, pressure might be used in conjunction with heat to give more suitable welding conditions. Here the heat serves to soften the metal and also to speed up the rate of recrystallisation so that, as the pressure crushes the two faces closely together, grain growth can take place between them, across the interface, without actual melting of the metal. Usually the greater the pressure the less the necessary external application of heat and vice versa.

When pressure is used, often to give suitable conditions for heating rather than to assist actual union (e.g. in spot welding), a flux could be used to assist deoxidation, but more often some form of deoxidation such as wire brushing, machining, or pickling would be performed immediately before welding and the pressure relied on to squeeze out, or render ineffective, any remaining harmful oxide.

Most welding processes have developed from the adoption of new methods for heating metal. Earliest heating was by charcoal fire, used for forge welding; then the gas and pressure air flame, and, later, the gas and pressure oxygen flame, were used to give more concentrated and intense heating, leading to oxy-acetylene welding. Arc welding processes grew from the attempt to use the concentrated

heat from the carbon arc. Further development took place with adoption of resistance heating,



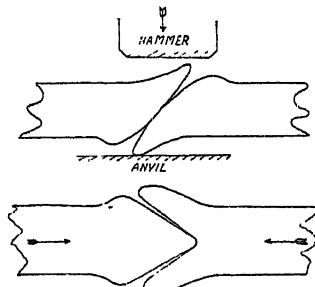
Welding. Stud weld (arc type) before and, bottom, after welding

leading to butt welding, spot welding, flash butt welding, etc. Use of the intense heat from the combustion of the thermit led to the development of the thermit processes; the use of the heat of recombination of atomised hydrogen led to the atomic hydrogen process; and so on. Development of techniques for control of the rates of heating and cooling made it possible to weld more metals.

All fusion welding processes are basically casting processes, so that a metal that will not cast easily will not as a rule weld easily by a fusion process. The simplest method of fusion welding is by pouring on. The joint is prepared in position within a mould of suitable size and shape. Super-heated molten metal is then poured into the mould, the volume of metal and degree of super-heat being adjusted so that there is sufficient heat to melt the joint faces and ensure effective union. It is a wasteful process, uncertain in its action, and requires considerable finish dressing. In thermit welding, applicable to iron and some steels, the melting and casting

are performed almost simultaneously under the influence of the heat and molten metal from burning thermit. This method was frequently used for joining tram rails; it is suitable for repair work on large cast iron parts.

In the oxy-gas processes oxygen and a combustible gas are mixed and burned under pressure, the intensely hot flame which results being used to produce localised melting and fusion of the joint faces assisted, possibly, by the addition of extra metal melted simultaneously from a separate filler rod. The process can be very economical and the resulting finish pleasing. Most welding of this type is done with a mixture of oxygen and acetylene gas in an Oxy-acetylene Blowpipe (*q.v.*); an



Welding. Smith weld before and, bottom, after welding

oxygen-helium mixture is used for welding light alloys.

Brazing and other similar methods in which a sandwiched, relatively low melting point, dissimilar metal is used to make the joint are most frequently done with the oxy-acetylene flame, though other means of heating can be used. The parent metal is not melted by the heat, but is raised to a sufficiently high temp. to permit its alloying with the molten joining metal, or to allow "wetting" of the joint face with the latter by adhesion.

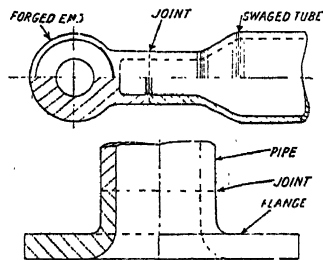
Electric welding, covering an important group of fusion welding processes, is described under that head. Its most important forms are shielded metal arc welding, carbon arc welding, and argon shielded arc welding. The arc method has been adapted to a method for automatic stud welding, differing from the projection method for stud welding. Developed from the shielded metal arc method is the automatic process called submerged arc welding. For this the flux coating of the metal filler wire electrode is replaced by a loose powder heaped around the

joint edges. The electrode tip is submerged in this powder and the arc is struck through it between the electrode tip and the work-piece. Unfused powder can be swept up after welding and used again. The method is applicable only to straight seams in the horizontal underhand position.

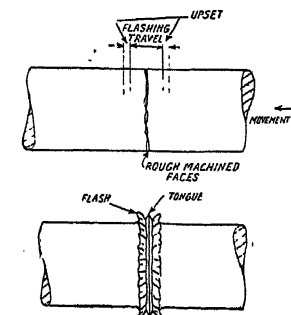
In still another fusion process, atomic hydrogen welding, the intense heat of recombination of atomised hydrogen is used for welding. Molecular hydrogen (H_2) is passed from a jet through an electric arc which causes the gas to separate to the simple atomic form (H). As it leaves the arc the hydrogen recombines, giving off intense heat in the process, before burning in the surrounding air. This process has a considerable field of usefulness in welding, *e.g.* heat-resisting alloys.

The oldest method of welding is the pressure method used, for butt welds, by the village blacksmith. In this the hammering gives the necessary intimacy of contact between the joint faces, and simultaneously drives some of the oxide to the outside of the joint, sometimes being assisted by a flux made from silver sand and burnt borax.

From the forge weld it is a simple development to butt welding and flash butt welding, processes in which the butting faces must be of identical shape and area. For butt welding each contact surface must



Welding. Flash welded pipe before and, bottom, after welding



Welding. Flash butt weld before and, bottom, after welding

be highly finished, to ensure uniformity of contact as the two faces are held together in the machine under pressure and electric current passed from one side to the other. Since the electric resistance at the interface is higher than in the rest of the circuit, heat is generated in the vicinity and current is passed until the parts are hot enough to deform plastically under the pressure and a weld is formed between them. Very heavy currents are needed. Flash welding requires less current and less accurate machining.

In spot welding, used for localised unions between overlapped plates, the applied pressure is used chiefly to give suitable heating conditions. Localisation of pressure and current in projection welding is secured by raising suitably shaped projections on the inner face of one or other of the two lapped plates before placing them in the machine. The plates are held together between two flat platen electrodes and current is passed from one to the other via the contacts with the tops of the projections, in which localities the heating takes place. This method is used for a form of stud weld in which the stud end forms the projection. In seam or roller seam welding the two spot welding electrodes are replaced by roller disks which revolve and feed the lapped joint through at a constant speed. Spot welds are made by switching the current on and off at regular intervals. These spots can be made to overlap and so produce a continuous gas- and water-tight joint which is a true seam weld.

The tendency in pressure welding is to use higher pressures with correspondingly less heat; e.g. to produce aluminium clad duralumin sheet, a thick slab of duralumin is hot rolled between two thinner slabs of aluminium, the slabs being welded to each other as the thickness is reduced to plate dimensions.

When wide use of welding began there was a general tendency to forget the mechanically rigid nature of a welded joint and to treat a design as if it had been bolted or riveted, with the result that, very often, disastrous stresses developed in what was nominally a safe structure, and welding was blamed. Once design was adapted to the process, the results were often revolutionary. Perhaps the best example of this was the development of the arc welded portal frame system for engineering structures by which spacious halls

and factories can be constructed without internal pillars and with little or no truss work. This type of welded construction was also adopted for use with reinforced concrete. Flash butt welding was used on high tensile steel structures to make shapes and attain strengths otherwise obtainable only by complicated forging or casting operations.

The various processes each have applications to which they are particularly suited; and different processes might each be economically used in different parts of one whole: e.g. in a normally designed aircraft argon arc welding, atomic hydrogen welding, brazing, flash butt welding, oxy-acetylene welding, projection welding, seam welding, shielded metal arc welding, soldering, and spot welding might all be present in different parts of the machine.

G. G. Tweeddale

Welfare. Term used to describe the care of employees customarily taken in large works over and above the provision imposed by law of adequate air, warmth, rest periods, etc. Welfare officers, specially trained to deal with human beings and with the duty to promote the health and happiness, and thereby the efficiency, of the workers, are appointed in many factories and other large industrial concerns.

Welhaven, JOHAN SEBASTIAN CAMMERMEYER (1807-73). Norwegian poet. Born Dec. 22, 1807, he was professor of philosophy at Christiania (Oslo), 1846-67, and died there Oct. 21, 1873. His first poem was a sonnet sequence, *The Twilight of Norway*, 1834. This was greeted with scorn by rival poets, and denounced as unpatriotic and unbalanced by others. It was nevertheless an epoch-making event in Norwegian literature, and Welhaven is now recognized as one of the finest modern Norwegian poets. His later volumes (1839, 1845, 1851, 1859) contain some of the most beautiful lyrics in the language. Many have been set to music by Kjerulf and others, and a few have been rendered into English by Johan Dahl in his collection of Norwegian and Swedish Poems, 1872.

Well. Artificial boring made in order to obtain water from the earth. This method of getting water is a very ancient one, and there are many references to wells in the Bible and in other early literature. The waters of many wells were believed to possess miraculous properties; hence the many

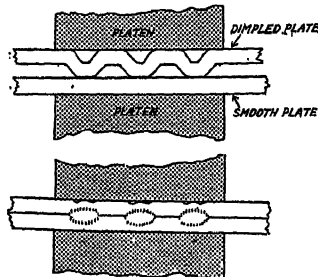
holy wells in various countries. Others were wishing wells, or were believed to possess powers of other various kinds.

Well sinking is among the most ancient branches of engineering. Until the end of the 18th century, all wells were dug or otherwise excavated; and, with few exceptions, were not of great depth. Some very large dug wells contribute to the water supply of London. These are sunk into the chalk, and from their bottoms horizontal headings are driven to great distances to obtain a large surface for percolation. Most wells today are driven or bored. Sinking a driven well consists of forcing down into the ground a jointed pipe until water is reached. More commonly, and always for great depths, the well is bored and lined with wrought iron. Bored wells are commonly called Artesian wells. Drilling is done either with rotating or with percussive tools. Oil wells are sunk and lined in the same way as water wells. See Artesian Well; Boring; Drilling.

Welland. River of England. It rises in Northants, and flows mainly N.E., forming the boundary between that county and Leics, and then Rutland. Near Crowland it enters Lincs, across which it flows to the Wash. It is about 70 m. long, and is used by small vessels as far as Market Deeping. This is one of the few English rivers which has an aegir (bore).

Welland. Town of Ontario, Canada. It is situated on the river and ship canal of the same name, 20 m. W. of Buffalo, and has stations on the C.P.R. and C.N.R. Its industries include the manufacture of farming machinery, forgings, shoes, and textiles. Pop. 15,780.

Welland Ship Canal. Canadian waterway connecting Lakes Erie and Ontario. First built 1824-29 as a small canal, having 40 wooden locks with a depth of 8 ft., it has undergone a series of developments culminating in 1914-29 in the construction by the dominion govt. of the present ship canal. This extends from Port Weller on Lake Ontario to Port Golborne on Lake Erie, a distance of 25 m., and represents one of the great engineering feats of the world. The 325-ft. difference in elevation between the levels of the two lakes is overcome by 7 locks each with a lift of 46½ ft.; at Thorold the flight locks, built double, have a combined lift of 139½ ft. Each lock is 859 ft. long and 80 ft. wide. The guard lock at



Welding. Projection weld before and, bottom, after welding

Humberstone is 1,380 ft. long. The canal, which in an eight-month season carries some 12,000,000 tons of cargo, is an integral part of the Great Lakes-St. Lawrence river route from the Atlantic to the heart of North America.

Welldon, JAMES EDWARD COWELL (1854-1937). A British schoolmaster and divine. Born



J. E. C. Welldon,
British schoolmaster
and divine

at Tonbridge, Kent, the son of a schoolmaster, he was educated at Eton and King's College, Cambridge. Having graduated as senior classic, he was fellow and tutor of King's before being appointed in 1883 headmaster of Dulwich. Two years later he became headmaster of Harrow, and was then bishop of Calcutta, 1898-1902. Next Welldon was chosen canon of Westminster, in 1906 dean of Durham. Distinguished as scholar, lecturer, and preacher, he published translations of Aristotle, sermons to boys, and *The Hope of Immortality*, 1898; *The Gospel in a Great City*, 1910; *Time and Eternity*, 1928; *Forty Years On*, 1935. He retired in 1933, and died June 17, 1937.

Welle. River of the Belgian Congo. It rises near the border with Kenya, W. of Wadelai, and flows W., forming the upper portion of the Ubangi (q.v.).

Weller, SAMUEL. Character in *The Pickwick Papers*, by Dickens. Sam is Mr. Pickwick's most devoted servant, a light-hearted, good-natured, humorous, shrewd cockney. The immense success of *The Pickwick Papers* on its original appearance in monthly parts dated from the first appearance of Sam in the 4th number, from which point onwards he figures in almost every scene, and becomes a leading character. The character, especially in respect of the tricks of speech which came to be known as Wellerisms (e.g. "Out vith it, as the father said to the child when he swallowed a farden"), is said to be based on that of an actor called Sam Vale. Sam's father, Tony, makes a later appearance in the book. He is a stout old coachman, full of quaint anecdote, and is also landlord of the Marquis of Granby, Dorking.

Welles, (GEORGE) ORSON (b. 1915). American actor and film director. Born at Kenosha, Wis., May 6, 1915, he went to high school at Woodstock, Ill., and made a stage debut in 1931 at the Gate Theatre, Dublin. He toured the U.S.A. with Katherine Cornell, and in New York founded the Mercury Theatre and was director of the Negro People's Theatre. In 1938 his broadcast adaptation of Wells's *War of the Worlds* created mass panic. As film director he made screen history with *Citizen Kane*, a masterpiece of satire, shown in England in 1942. Other expressions of a sombre personality were *The Magnificent Ambersons*, and *Journey into Fear*; he acted Rochester in *Jane Eyre*, and Harry Lime in *The Third Man*.



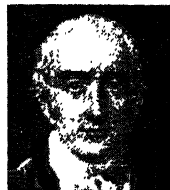
Orson Welles,
American actor

Welles, SUMNER (b. 1892). American politician. Born in New York, Oct. 14, 1892, he was educated at Groton and Harvard. After holding diplomatic posts in Tokyo and Latin America, he was Coolidge's representative in Honduras during the revolution of 1924. Assistant secretary of state from 1933, with a short period as ambassador to Cuba, he became under-secretary in 1937. Welles carried out a "fact-finding" mission for Roosevelt in Germany, Italy, and Great Britain at the beginning of the Second Great War. After the U.S.A. entered the war Welles held innumerable interviews with European and Asiatic diplomats, and headed a delegation to the Pan-American conference at Rio. A committee of which he was chairman drafted a document which with few changes emerged as the agreement of the Moscow conference, 1943. Differences on policy were reputed to have led to his resigning the under-secretaryship on Sept. 25 that year. Welles published *Naboth's Vineyard*, 1928; *The World of the Four Freedoms*, 1943; *Where Are We Heading?*, 1947; and edited an English trans. of the diary of Count Ciano.



Sumner Welles,
American politician

Wellesley, RICHARD COLLEY WELLESLEY or **WESLEY, MARQUESS** (1760-1842). British administrator. Born at Dangan Castle, Meath, June 20, 1760, he was a son of the earl of Mornington and elder brother of the duke of Wellington. Educated at Eton and Christ Church, Oxford, he succeeded to his father's Irish title in 1781, and in 1784 was elected an English M.P. In 1797, having held minor offices under Pitt, he went out to India as governor-general, and there he remained until 1805, greatly enlarging the authority of Great Britain, disposing of French rivalry, winning the Mahratta War, and proving himself in war and peace alike a capable and enlightened administrator, although his innovations in the civil service and attempts at introducing free trade were severely criticised. As a Tory politician and a marquess, created in 1799, Wellesley was foreign secretary 1809-12, and lord-lieutenant of Ireland 1821-23, supporting the movement for R.C. emancipation. He died without sons, Sept. 26, 1842. See India. *Consult* Lives, W. M. Torrens, 1880; W. H. Hutton, 1893; G. B. Malleon, 1905; India under Wellesley, P. E. Roberts, 1929.



Marquess Wellesley,
British administrator
After Sir T. Lawrence

Wellesley College. American college for women, at Wellesley, Mass. It was founded by Henry Durant (1822-81), Boston lawyer, business man, and evangelist, who with his wife, decided in 1870 to devote their country home and fortune to the Christian education of young women. It was greatly developed during 1882-87 under the presidency of Alice Palmer, who transformed it from a kind of boarding school to a genuine college. There are now 1,700 students, a teaching staff of 200, and an endowment of over \$13,000,000. Mme. Chiang Kai-shek is the best known of its students.

Wellhausen, JULIUS (1844-1918). German Biblical critic. Born at Hameln, Westphalia, May 17, 1844, he was educated at Göttingen. In 1872 he became professor of theology at Greifswald, in 1882 at Halle, and in 1885 at Marburg. During 1892-1913 he was professor of Oriental languages at Göttingen, and he died

Feb. 20, 1918. Wellhausen made his reputation by scientific critical works on The Bible, among which The Composition of the Hexateuch, 1889, is a standard work. See Criticism, Biblical.

Wellingborough. Market tn. and urban dist., giving its name to a co. constituency of Northants,



Wellingborough, Northamptonshire. Parish church of All Hallows and memorial cross to the townsmen who fell in the First Great War

England. It stands on a hill, near the Nene, 10 m. N.E. of Northampton, and has stations on the rly. The principal churches are All Hallows, an ancient building, and S. Mary's, modern. The town is a centre of agriculture, and of the boot and shoe industry. Beer is made, and there are foundries and smelting works. Wellingborough had a market as early as 1200, and at one time was known for its chalybeate waters. Pop. est. 28,571.

Wellington. Vessel moored on the Thames, at Temple Stairs on the Victoria Embankment, London. Acting as the livery hall of the honourable company of master mariners, she was formerly an Admiralty sloop and was converted at Chatham in 1948, arriving at her present berth on Dec. 9. The handsome court room occupies what was once the engine room. A double staircase came from the old passenger ship Viper.

Wellington. Type of British bomber aircraft. It was designed and built by Vickers-Armstrongs; it first flew in 1936, and delivery to R.A.F. squadrons began in 1939. The Wellington was the first military aircraft built on the geodetic principle, and eighteen versions were developed.

A midwing cantilever monoplane, the Wellington was powered by twin engines developing a total of 2,100 h.p. to give a speed of 300 m.p.h. The aircraft had a range of 2,550 m. and carried a crew of six. Armament consisted of six to eight .303 machine guns. Until the introduction of the four-engined bomber, the Wellington was the backbone of Bomber Command's striking force in the Second Great War. It first went into action at Wilhelmshaven the day after war was declared, and was in continuous service with Bomber and Coastal Commands, operating from bases in Great Britain, India, the Middle East, N. Africa, and Italy. It served on convoy protection, overseas reconnaissance, mine-laying, anti-submarine duties, and was used to detect and explode magnetic mines. Wellingtons with Coastal Command were equipped to carry depth charges, mines, torpedoes, and a Leigh Light. At the end of the war, 11,391 Wellingtons had been built and put into service. From this machine was developed the slightly larger Warwick, used for sea-air rescue work and as a transport. See Geodetic Construction.

Wellington. Prov. of New Zealand. Situated at the S. end of North Island, it has an area of 10,870 sq. m. It is traversed by several mountain ranges, with Ruapehu as the highest peak (9,068 ft.). The chief towns are Wellington and Wanganui. Agricultural, pastoral, and timber-growing industries support a pop. estimated at 367,500.

Wellington. Market town and urban dist. of Shropshire, England. It is 10 m. E. of Shrewsbury and 152 m. N.W. of London, being a rly. junction and also on a canal leading to the Severn. The chief church is All Saints, and

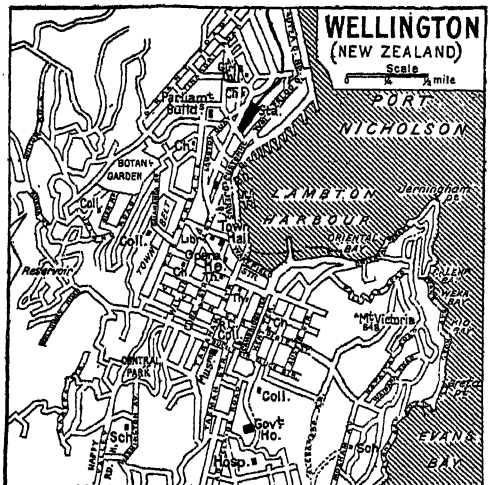


Wellington. An R.A.F. Wellington bomber as used in the Second Great War

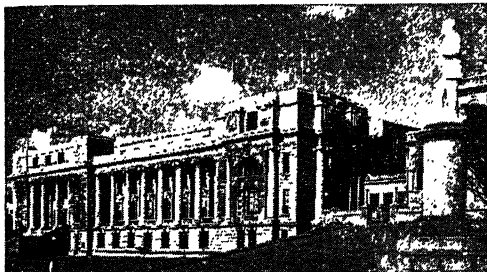
industries include making agricultural implements and malting. Wellington was once important because of its position near the Welsh border. For parliamentary purposes it is included within the Wrekin division. Pop. est. 12,000.

Wellington. Market town and urban dist. of Somerset, England. It stands on the river Tone, 6 m. S.W. of Taunton, to which there runs a rly. The chief building is St. John's church, a fine Perpendicular edifice of the 15th century. There is a county school. Woollen textiles, furniture, and bricks are made. On the Blackdowns is a monument to the duke of Wellington, who took his title from this town. Pop. 7,128.

Wellington. Capital of New Zealand since 1865. Situated in Wellington prov., North Is., it stands on the W. shore of Port Nicholson, an inlet of Cook Strait. Gibbon Wakefield planted his first settlement here in 1840, naming it Britannia, this being later changed in honour of the victor of Waterloo. The chief feature is a magnificent harbour 6 m. long by 5 m. wide, from which are shipped to overseas markets large quantities of butter, cheese,



Wellington. Plan of the capital of New Zealand



Wellington, New Zealand. The Parliament buildings, showing, right, the statue of John Ballance, a former premier

mutton, beef, wool, apples, and timber. Most of the houses are still of the wooden bungalow type, mainly situated on the slopes of hills which enclose the town. There are fine public buildings, including Government House, the houses of parliament, and the university college, while the national museum is here. Building of a cathedral was destined to start in 1951. Wellington is the seat of an R.C. archbishop. There is little heavy industry, but many small establishments are engaged in the manufacture of soap, candles, ropes, and woollens; there are also some brewing, tanning, and shipbuilding. Wellington is connected by rly. with Auckland and Napier. Pop. est. 186,000.

Wellington. Mt. of Tasmania, Australia, 4,166 ft. high. It lies immediately to the W. of Hobart. A motor road to the summit, opened in 1937, has magnificent views. Mt. Wellington is a winter sports resort.

Wellington. Municipality in Wellington co., New South Wales, Australia. A gold-mining centre at the junction of the Bell and Macquarie rivers, it is 255 m. by rly. N.W. of Sydney. The surrounding area is a progressive farming and pastoral dist., one of the chief crops being onions. Near by are caves in the limestone rocks similar to the famous Jenolan Caves.

Wellington, Duke of. Title borne by the Wellesley family since 1814. Arthur Wellesley, the great soldier (*v.i.*), was raised through the peerage to a dukedom in 1814. On his death in 1852 he was followed by his son Arthur (1807-84), who in 1863 succeeded to the earldom of Mornington, another peerage in the family. He died without issue and was succeeded in turn by nephews. In 1943 the title came to Gerald Wellesley as 7th duke. He was born Aug. 21, 1835, and married Dorothy Violet

British soldier and politician. A younger son of Garrett Wesley (d. 1781), 1st earl of Mornington, an Irish peer, he was born in Merrion Street, Dublin, April 29 or May 1, 1769. His family had been settled in Ireland for about 200 years; its original name of Colley had been changed to Wesley and later became Wellesley. Educated at Eton, Arthur went afterwards to a military school at Angers. In 1787 he



Wellington

After Count D'Orsay, in the National Gallery, London

entered the 73rd Highlanders and in 1793 became a lieut.-col. in the 33rd Foot (now Duke of Wellington's Regiment). He also sat in the Irish parliament for Trim. In 1794 he saw active service in the Netherlands and in 1796 went to India, where his elder brother soon became governor-general. Arthur was made commander-in-chief in Mysore, and in 1803 conducted with marked success a campaign against the Mahrattas, his greatest exploit being the victory at Assaye, Sept. 23. For this he was knighted

Ashton, known as a poet under the name of Dorothy Wellesley. The eldest son bears the courtesy title of marquess of Douro. The seat of the duke is Strathfieldsaye, Hants.

Wellington, ARTHUR WELLESLEY, 1ST DUKE OF (1769-1852).

and thanked by parliament. From 1805, when he left India, to 1808 he was fighting in Hanover and Denmark, while also M.P. for Rye and secretary for Ireland.

In 1808 Wellesley went to Portugal in command of a division. Though he won the battle of Vimeiro, superior officers did not approve of his actions and he returned to England. In 1809, however, he went back to Portugal in chief command, and until 1814 led the campaign against France which is described under Peninsular War. His rewards were considerable. The English king made him viscount in 1809, earl and marquess three years later, and in 1814 duke, while £100,000 was voted to him. Spain and Portugal each created him a duke. After the last battle, at Toulouse, Wellington was sent to Paris as ambassador, and he was at the congress of Vienna when the news of Napoleon's escape from Elba arrived. At once he took command of the British army and its allies, and won the decisive battle of Waterloo (*q.v.*). From 1815 to 1818 he was in France in command of the international army of occupation. Despite his moderation his popularity in France waned and attempts were made to kill him.

In 1818 the duke really began his career as a Tory politician; he became master-general of the ordnance under Liverpool. In 1821 he attended the congress of Verona. In 1826 he was made commander-in-chief, but next year resigned his offices owing to a dislike of Canning. He returned to the headship of the army on the latter's death, and in 1828 became prime minister. During his term of office he repealed the Test and Corporation Acts and was responsible for the emancipation of the Roman Catholics, but he would not assent to the proposed extension of the franchise, and in 1830 he resigned. In 1834-35 he was foreign secretary under Peel, and during 1841-46 was cabinet minister without portfolio. He died at Walmer Castle, Sept. 14, 1852, as warden of the Cinque Ports. He was buried under the dome of St. Paul's cathedral; a monument to him was erected in the nave.

Wellington has been called a lucky mediocrity; but it is fairer to say he achieved outstanding success by keeping both feet firmly on the ground and through his abundant common sense, conscientiousness, and complete integrity. He was no self-seeker; he was stiff, reserved, a profound

believer in the order of things, dividing the world into those who ruled and those who obeyed. The nickname of Iron Duke testifies to his stern discipline, and few commanders can have made troops perform such services without any mutual affection. He was not inhuman; he liked and was adored by children, and the marriage he made with Kitty Pakenham, daughter of Lord Longford, was romantically undertaken even if it largely failed. Many laconic remarks have come down as reminders of his sardonic humour.

Without strategic genius, he was probably unsurpassed even by Napoleon or Marlborough on the battlefield, while his organization of supplies and of the material welfare of troops was a model. His international outlook after the Vienna treaties was conciliatory; and in domestic politics, though a poor debater, though so much opposed to the Reform Bill that his windows were broken by the mob, he was ready to put public good before the party interest, and loyally backed the reforms of Peel. Prestige remained to the end: he was the man who had beaten Napoleon; and the grief shown at his funeral has seldom been equalled. The Wellington memorial stands at Hyde Park Corner

and near by in the park the Achilles Statue (*q.v.*) also commemorates the duke. Another statue is outside the Royal Exchange. And, as Guedalla said, "How many English streets, squares, monuments, and licensed premises bear the name of Wellington? His title has become one of the commonplaces of urban, and even imperial, topography." See Apsley House, also in N.V.; Strathfieldsaye; and articles on the various battles.



Wellington College, Berkshire. Main building of the public school opened in 1853

Bibliography. Wellington Dispatches, ed. J. Garwood, 1837-45; Letters, ed. as A Great Man's Friendship, Lady Burghclere, 1927; Lives, Sir H. Maxwell, 1900; J. W. Fortescue, 1925; The Duke. P. Guedalla, 1931; The Man Wellington, M. Wellesley, 1937; Napoleon and Wellington, C. O. Head, 1939; Wellington, R. Aldington, 1946.

Wellington Barracks. London barracks. Headquarters of the Foot Guards, they are at the S.W. corner of St. James's Park (*q.v.*), between Birdcage Walk, Buckingham Gate, and York Street. Built in 1834, they were enlarged in 1859. The Guards' Chapel (*q.v.*) was destroyed by a German flying bomb during a service, on Sunday, June 18, 1944.

Wellington College. English public school. It was founded as a memorial to the 1st duke of Well-



Wells, Somerset. West front of the cathedral, considered one of the best examples of Early English ecclesiastical architecture. It is ornamented with over 300 statues, many of which are perfect specimens of medieval sculpture. Upper picture, the 15th century gateway of the castellated bishop's palace, founded in 1088, from the moat. See p. 8506

Frith

ington, public subscriptions being obtained to establish a school for the education of the sons of deceased army officers. A site was secured near Wokingham, and the buildings were opened in 1859. There are a college proper and four houses, altogether holding about 620 boys, ninety sons of deceased army officers being received on the foundation at nominal fees.

Wellingtonia, REDWOOD, OR BIG TREE. Huge evergreen tree (*Sequoia gigantea*) of the family Pinaceae. A native of the mountains of California. It is one of the tallest trees, attaining a height of over 320 ft., with a trunk diameter of 35 ft. The leaves are small and like green scales, overlapping on the branches and twigs. The male flowers are single or several together at the ends of shoots; the female flowers at the tips of other shoots may be passed over as growth buds. The cones are oval with blunt ends, 2-3½ ins. long, consisting of comparatively few four-pointed scales, with a depression in the middle of each. By growth-rings, one specimen of which a cross-section has been obtained has been computed at over 3,000 years old.

Wells. City of Somerset, England. It lies low, being encircled by the Mendips, 20 m. S. of Bristol, and has rly. stations. The magnificent cathedral, built mainly in the 12th and 13th centuries, with a west front adorned with sculptured figures, is almost the finest in England, and has some fine stained glass, and a wonderful clock. Close by is the bishop's palace, surrounded by a moat. Vicars' Close contains old houses, forming a picturesque avenue, with a little chapel at the end. S. Cuthbert's is a fine church, spacious and with one or two interesting relics. In Wells is an important theological college for the Anglican ministry. The city owes its origin and its name to some springs dedicated to S. Andrew. It was made the seat of a bishop about 900, and in 1139, after continuous disputes with Bath, the see was given the name of Bath and Wells. Wells has long been a corporate town, and was represented in parliament until 1868. Formerly a market for cloth, it now has fairs and markets for sheep, cattle, etc. Pop. est. 5,900. See illus., p. 8505.



Wells arms



C. J. Wells,
British poet

latter's lectures, and practised for some years as a solicitor. His first

Wells, CHARLES JEREMIAH (c. 1798-1879). British poet. A Londoner, he became acquainted with Keats and Hazlitt, attending the

literary effort, *Stories After Nature*, 1822, was unsuccessful. Joseph and his Brethren, a dramatic poem, also failed when published in 1823, and was entirely lost sight of until 40 years later its merits were recognized by Rossetti and Swinburne. Meantime Wells had settled in France, amusing himself with field sports and with writing, but his reputation rests on Joseph and his Brethren. Wells died Feb. 17, 1879.

H. G. WELLS: WRITER AND PROPHET

Richard Church, Novelist, Poet, and Critic

An account of the life and works of the most prolific British writer of the years 1890-1940, whose powers of scientific and political prophecy were equalled by his genius for telling a story and his passionate enthusiasm for the idea of human rights. Many of his works are noted separately

Herbert George Wells, the most prolific and influential British writer since the death of Dickens, was born Sept. 21, 1866, at Bromley, Kent. His father was a professional cricketer who kept a retail shop, and his mother had been, and was to be again, in domestic service. One of a large family in a household suffering from chronic lack of prosperity, the boy's abnormal genius for speculation was early fastened upon the problem of economics, the effect of poverty upon a free and full functioning of the intellectual and moral endowment of the individual and consequently of society. Shaw called poverty a crime. Wells always looked upon it as a disease. Throughout the many phases, aspects, and forms of his literary output, this primary motive was at work, colouring his aesthetic nature, and shaping the direction of his scientific interests.

He was apprenticed to a draper in Hythe, but at 18 left the world of trade and became a pupil teacher. Thence he went to what became later the Royal College of Science at S. Kensington, where he followed the lectures of T. H. Huxley. From that time both emotional and mental emancipation marked this creature of perfervid genius. It expressed itself in many ways, one of them being his traffic with the Fabian society and the Labour party in their early days. But neither administrative methods nor political machinery satisfied him as instruments of the surgical process which was to cure society of its ills. For one thing, both organizations accepted the fact of class distinctions. Wells would have none of this, nor of the class warfare by which the Labour party proposed to remove those distinctions.

Wells's nature (and it was always the nature of an artist) led him to adopt the method and theory that were most direct, most simple, and most immediate. He believed that by scientific education, with emphasis upon biology, mankind could be brought to a consciousness that society too can be established upon a biological



basis, as a single living organism in which no member is more important than another, because all are complementary. In such a smooth-working and efficient unit, the finally integrated family of man, it would be as absurd to talk of one man being in a different social order from another as it would be, in a human body, to call the heart the seigneur over the kidneys.

It is no exaggeration to suggest that this was the lifelong argument maintained by Wells through all the chameleon forms of his vast literary output: novels, romances, pamphlets, short stories (The

Country of the Blind, one of the greatest short stories in English, is a direct allegorical exposition of this argument), histories, and social philosophies. This principle made him a devastating iconoclast. The Caesars, the Napoleons of history no sooner appear upon the scene of the human story than Wells retires to his laboratory methods, and with an air of calm detachment proceeds to attack such monumental figures with an unexampled intensity of venom. Vague self-aggrandisement, ego-centric mysticism; these were for him the capital enemy of scientific and efficient progress toward a society run on oiled economics.

Wells's Chief Books

After taking his science degree in London university, Wells began his writing career with a handbook of biology. Expanding his studies by the aid of his genius and powerful imagination, he wrote the scientific romances that rapidly made him famous. At 30 he was a successful author in a class of his own making. If he had any antecedents, they must have been the authors of Utopia, Gulliver's Travels, and The Flying Indians. But in the breadth of humanity, the keen observation, the vast range of good-humoured sympathy, by which even the earliest of Wells's romances are marked, this great social doctor must surely be indebted to a Kentish predecessor, Chaucer. Wells's most mature and characteristic work, *Tono-Bungay*, shows a full, Chaucerian capacity for laughter, that laughter which comes only from the depths of a giant appetite for life.

His early books included *The Time Machine*, 1895, *The Island of Doctor Moreau*, 1896, *The Invisible Man*, 1897, *The War of the Worlds*, 1898, *When the Sleeper Wakes*, 1899, *The First Men in the Moon*, 1901, *The Food of the Gods*, 1904, *In the Days of the Comet*, 1906, *The War in the Air*, 1908. These were published while the author was still busy with his pamphleteering strife among the Fabians, in the course of which he produced *This Misery of Boots*, 1907, *New Worlds for Old*, 1908.

Combining sociology and his more free imaginative excursions, he wrote *Anticipations*, 1901, *Mankind in the Making*, 1903, and *A Modern Utopia*, 1905. But the combination was not absolute, in an artistic sense, until those books appeared by which he is most likely to be remembered. They had been indicated by his early book *The Wheels of Chance*, 1896,

in which his constant and central figure, that of a meek, mild, obstinate little "common man" first appeared; the still, small critic of the monstrous growth of industrial society: its critic as well as its victim. That figure emerges in almost every one of his romances as well as his straight novels. Think of Bert Smallways, in *The War in the Air*. Think of Kipps, of Mr. Lewisham, of Mr. Polly. The same little figure is really the narrator of *The Outline of History*, 1920, that book which summed up the whole attitude of the small, technical iconoclast, the unit of modern society, the ferment at work today in this vast leavening process which was still more accelerated by the Second Great War.

The core of Wells's work was such full-blooded as well as intellectualised novels as *Love and Mr. Lewisham*, 1900, *Kipps*, 1905, *Tono-Bungay*, 1909, *Ann Veronica*, 1909, *The History of Mr. Polly*, 1910, *The New Machiavelli*, 1911, *The Passionate Friends*, 1913, and *Joan and Peter*, 1918. These are only examples, not a list, of his work in this kind.

Thereafter, he tended, from about the end of the First Great War, to use the novel with a more urgent social purpose. This robbed his work of the opportunity to present more memorable individuals such as Mr. Polly, and Uncle Ponderevo (in *Tono-Bungay*). After *The Outline of History*, 1920, he followed with variations upon that colossal text: *The Salvaging of Civilization*, 1921, *A Year of Prophesying*, 1924, *The Way the World is Going*, 1928, *The Open Conspiracy*, 1928, and innumerable smaller prophetic Jeremiads. He also produced, with Julian Huxley and his son G. P. Wells, *The Science of Life*, 1929; and, again alone, *The Work, Wealth, and Happiness of Mankind*, 1932. *Experiment in Autobiography* came in 1934; and in the last years of his life, when he was ill and tired and had almost lost hope in mankind, he still tried to prod the human race along the road to its salvation. He died in London, Aug. 13, 1946.

Like Tolstoy, Wells seems in later life to have become impatient of his earlier activities as pure artist (for Wells was an artist of high calibre). At first he was content to symbolise his emotional reactions to the evils of society through a gallery of characters in the Dickens tradition: comic, pathetic, even

tragic figures struggling against their own illiteracy and political ignorance, fighting to get out of the rut, to look around on the mess which the machine age was making of the fair world of nature. Gradually that struggle became an obsession with Wells. He joined in the struggle, and his novels became a stamping ground whereon his ideas wrestled with his indignation; and with Tolstoy, he took his mission so seriously that he professed to have no time for his art as a novelist. But his great work remained as salutary as his later sermons, and the more memorable. They made him, with Shaw, one of the most powerful influences in his time, a time which began to show its full features at the beginning of the 20th century, with the old political and religious forms breaking up, in preparation for those still to be established.

Apart from Wells's autobiography, there are not many books about his life; but H. G. Wells: a Sketch for a Portrait, by G. West, 1930, is useful.

Wells, WILLIAM (b. 1889). British boxer, known as Bombardier Wells. Born in London, Aug. 31, 1889, he enlisted in the army and won the All India boxing championship. His professional career was erratic; he won the heavy-weight championship of England by defeating Iron Hague in six rounds at the National Sporting Club, April 24, 1911, but was twice knocked out within one year (1913) by Carpenter, at Ghent, and at the National Sporting Club. On Feb. 27, 1919, he lost the English heavy-weight championship to Joe Beckett (q.v.). Defeats and victories continued to alternate until he retired in 1925.

Well-Worship. Ritual veneration of water wells, fountains, springs, and pools. The worship may be addressed to the waters themselves, because of their animation or mysterious powers, or to the deities or non-human spirits deemed to have in them their casual or permanent abode. Primitive well-worship associated with W. Asian pastoral nomadism is recalled by biblical references to Beersheba, Shechem, and Bethlehem.

In Neolithic times Iberian agricultural peoples carried to Britain and Ireland magico-religious usages, including the recognition of water-spirits. Survivals are traceable throughout Scotland, Ireland, Wales, and Cornwall. Wishing and healing wells, as at

St. Oswald's, Oswestry, and Worm Well, Durham, cover the marches of W. and N. England. *Consult Ethnology in Folklore*, G. L. Gomme, 1892; *Lore of Holy Wells of England*, R. C. Hope, 1893.

Wels. Town of Upper Austria. It stands on the Traun, 15 m. by rly. S.W. of Linz. The chief building is a Gothic church of the 15th century, the successor of an older one. There are a museum, a tower of the 14th century, and a building in which Maximilian I died in 1519. The town has some manufactures, but more considerable is its agricultural trade. A supply of natural gas is obtained by deep borings. The town occupies the site of the Roman *Ovilaba*, and was in the Middle Ages the capital of a duchy. Pop. 33,908.

Welsbach, CARL AUER, BARON VON (1858-1929). Austrian chemist. Born in Vienna, Sept. 1, 1858, he was the son of the inventor of the automatic printing press, Aloys von Welsbach (1813-69). He studied chemistry under Bunsen at Heidelberg, specialising in rare ores, and made technical inventions. Working at Vienna university from 1882, he discovered the elements neodymium and praseodymium. In 1885 he evolved the mantle for gas light; in 1900 the osmium lamp; in 1904 the pyrophoric alloys used later in cigarette lighters. Welsbach thus became instrumental in the creation of new and important industries, in which he also held material interests. He died Aug. 4, 1929.

Welsh, FREDERICK (1886-1927). British boxer. Born at Pontypridd, March 5, 1886, he won the English light-weight championship in 1909 by defeating Johnny Summers. Beaten by Matt Wells in 1911, he regained the title from him next year. He beat Hughie Mehegan for the championship of the British Empire at the National Sporting Club, Dec. 16, 1912; and became light-weight champion of the world by defeating Ritchie at Olympia, July 7, 1914. This last title he lost in 1917 to Benny Leonard, U.S.A. He died July 28, 1927.

Welsh Corgi. Small, sturdy, short-legged dog, originating in Wales, where it is used to drive cattle and on farms. The name is said to be derived from *Welsh cor*, dwarf; and *gi* or *ci*, dog. There are two varieties, the Pembroke and the Cardigan corgi. Both have fox-shaped heads, erect ears, rather long bodies, strong hind quarters, and an alert expression. The Pembroke corgi, slightly the larger, has short straight legs with feet like

those of a collie, a short erect tail, and a dense coat, red or red and white. The Cardigan corgi has slightly bowed front legs, large round feet, and a moderately long tail in a line with the back; its hard-textured coat may be almost any colour except pure white.

Welsh Guards. Regiment of the British army and a unit of the Guards bde. Formed in Feb., 1915, from a nucleus of Welshmen with the Grenadier Guards, the regiment went to France in Aug. and served there for the rest of the First Great War. Among the battle honours awarded were: Loos; Ginchy; Flers Courcellette; Morval; Pilkem; Poelcappelle; Cambrai, 1917, '18; Bapaume, 1918; Canal du Nord; Sambre. In May, 1939, a second bn. was formed, and at the outbreak of the Second Great War both bns. went to France and fought through the campaign of 1940. Next year they joined the Guards armoured div. with which



Welsh Guards badge

they served in the liberation of Europe (1944-45). A third bn. raised in 1942 became an armoured unit in N. Africa and Italy; it was disbanded in 1945, and the 2nd bn. in 1947.



Welshpool, Montgomeryshire. Parish church of S. Mary
Valentine

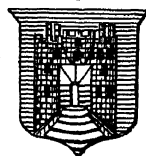
ment. Market day, Mon. Population 5,700.

right hand of the comb, for which reason it was held on the left shoulder, the left hand playing the treble and the right hand playing the bass strings.

Welsh Harp. Name of two inns, the Old and the New (or Upper) Welsh Harp, W. of Golder's Green and Hendon, in Middlesex, England. Formerly popular resorts, they are in the Edgware Road, in a fork of the Brent Reservoir, now itself known as the Welsh Harp.

Welsh Marches. For these border territories, see *Marches*.

Welshpool. Mun. bor. and market town of Montgomeryshire, Wales. It is 15 m. S. by W. of Oswestry and 182 m. N.W. of London, on the Severn and Montgomery canal and on the rly. Founded in the 12th century. It owes its existence to the neighbouring Powis Castle, the seat of the lords of Powis, and later of the Herbert family. The Gothic church of S. Mary was restored in 1871. Other buildings are the town hall, the Powysland museum of antiquities, and library. There is a trade in agricultural produce and some tanning. This is a good centre for angling and climbing. Welshpool was a borough under the lords of Powis before James I confirmed its charter in 1615. From 1536 to 1728 it sent a member to parliament.



Welshpool arms

Welsh Poppy (*Meconopsis cambrica*). Perennial herb of the family Papaveraceae. A native of W. Europe, it has a stout rootstock, branching to form a tuft. The long, pale green leaves are cut in from the sides into lance-shaped segments. The large, four-petalled, long-stalked flowers are pale yellow in colour, and the fruit is a capsule of the usual poppy type.



Welsh Poppy. Pale yellow flower, seed capsule, and leaves

Weltpolitik (Ger., world policy). Term used in Germany before 1918 for the policy of making that country a world power. It is chiefly associated with the period covered by the reign of William II.

Welwitschia Mirabilis. Shrub of the family Gnetaceae. It is a native of arid places near Mosamedes and Haigamchab in S.W. Africa. Its "trunk" consists of a brownish yellow disk of hard wood only a few inches from the ground, from which proceed a solitary pair of leathery, ribbon-like leaves, each six feet or over in length, more or less split into slender thongs. These are the only leaves the plant ever puts forth, and they last throughout its entire life, which exceeds a century. The flowers are produced in small, erect, scarlet cones near the edge of the disk.

Welwyn. Rural dist. of Herts, England. It is in the valley of the Maran or Mimram, a trib. of the Lea, and is 22 m. by rly. N. of London. Edward Young, author of *Night Thoughts*, was rector here, 1730-65, and is buried in the parish church.

Near by, just off the Great North Road, is Welwyn Garden City, which was begun in 1920, being planned on a site of some four sq. m. as the first example in the U.K. of a satellite town. It was designed to accommodate some of London's surplus pop., and at the same time to develop its own industries on suitable sites, away from the main residential areas. Originally developed by a private co., the town was in 1948 taken over by the ministry of Town and Country Planning as a "new town." Hatfield (q.v.) came within

the same scheme of expansion, and was under the control of the same development corporation, although the two towns retained their separate identities. *Pron.* Wellin.

Wem. Market town and urban dist. of Shropshire, England. It is 11 m. N. of Shrewsbury, on the mainly. to Crewe. An agricultural town, it has cattle markets and other trades in the produce of the surrounding dist., while flour milling, cheese making, and brewing are carried on. The chief church is SS. Peter and Paul, with its Norman tower. Wem was at one time a corporate town, being governed by two bailiffs. In the neighbourhood is Hawkstone Hall, the old seat of the Hills, now used by an R.C. community. Market day, Thurs. Pop. est. 2,400.

Wembley. Municipal borough of Middlesex, England. Lying midway between Willesden on the E. and Harrow on the W., it includes Alperton, Kenton, Kingsbury, Preston, and Sudbury, and achieved the status of a borough in 1937. It has had two M.P.s since 1944. There are 15 stations on five rly. lines, including the Underground, and excellent connexion with London by bus, trolley bus, and Green Line, while the Grand Union Canal passes through Alperton. The parish church of S. John was designed by Sir Gilbert Scott; old S. Andrew's, Kingsbury, is the



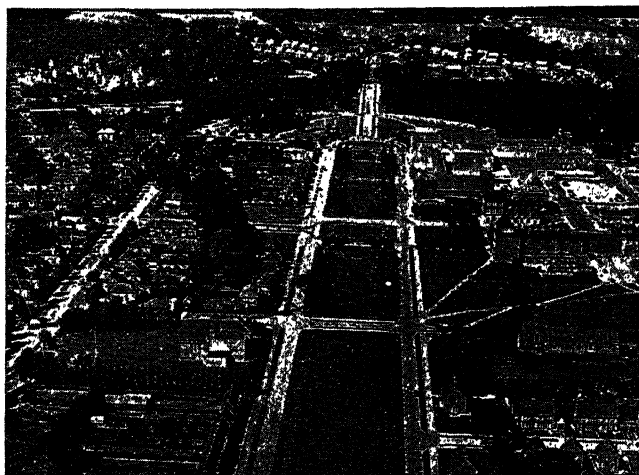
Wembley, Middlesex. The Town Hall, municipal offices, and public library (left), built 1939

only church in Middlesex preserved from pre-Norman times. Municipal buildings in Forty Lane were put up in 1939. The Watkin tower was an unfinished curiosity. Wembley is overwhelmingly residential in character, but has motor, aircraft, electrical and chemical industries. Its development began with the planning of the British Empire Exhibition (q.v.) of 1924-25, after which it became a sporting centre, for the F.A. Cup and Rugby League finals are played annually in the stadium of that exhibition, while the Empire pool and sports arena holds big swimming, skating, ice hockey, boxing, and other contests. The athletic, swimming, and fencing events of the 1948 Olympic Games were held here, and there are dirt track and greyhound racing at the stadium. The name Wembley is first found in 825; for c. 1,000 years the old village belonged to the manor of Harrow. Pop. est. 132,870.

Wemyss. Name of two small towns in Fife, Scotland. West Wemyss stands on the Firth of Forth, 2 m. N. of Dysart; it has a rly. station and a harbour. In the neighbourhood is Wemyss Castle. East Wemyss is 2 m. S.W. of Backhaven, also with a rly. station.

Wemyss Bay is a small seaport and watering-place of Renfrewshire, Scotland, 31 m. W. of Glasgow. Near is Castle Wemyss, seat of Lord Inverclyde. *Pron.* Weema.

Wemyss, EARL OF. Scottish title held by the Charteris family. The first holder was Sir John Wemyss, created a baron in 1628 and earl of Wemyss in 1633. After the death of James, 5th earl, the title fell into abeyance, as the heir, David, had been attainted for his share in the rebellion of '45. Francis, great-grandson of the 5th earl, was created Baron Wemyss in 1821, and five years later secured the reversal of the attainder, thus becoming 6th earl of Wemyss. From him the succession passed direct to Francis, 12th earl, who was born Jan. 19, 1912, and suc-



Welwyn, Hertfordshire. A view of Welwyn Garden City, a famous British example of modern town-planning

ceeded his grandfather in 1937. He is also 8th earl of March. The heir bears the courtesy title of Lord Elcho.

Wen. Popular name for a sebaceous cyst tumour which tends to grow most frequently on the scalp in adults and old persons. A wen is not dangerous, and can be excised by a simple operation. The Great Wen, or simply the Wen, was Cobbett's name for London.

Wenceslaus, VENCESLAS, OR VACLAV (d. c. 929). Bohemian saint and prince. Converted to Christianity, he received the tonsure in the church at Levy Hradec, founded 871. He founded many churches in Prague and elsewhere in the principality, his generosity to them causing some discontent among the nobles. He was assassinated by his ambitious brother, Boleslav, on his way to early Mass on Sept. 28, probably 929, at Stará Boreslav. In 939 his body was removed to the church of S. Vitus in Prague. He was canonised, and is being regarded as the patron saint of Bohemia, the anniversary of his death being his festival. He is the Good King Wenceslas of the song.

Four kings of Bohemia bore this name, of whom Wenceslaus IV is noticed below.

Wenceslaus (1361-1419). King of Bohemia and Germany. Son of the emperor Charles IV, he was born at Nuremberg, Feb. 26, 1361. His father was also king of Bohemia, and made him ruler of that country before he was three years old. Wenceslaus was chosen German king in 1376, and two years later, when Charles died, he held sway over Germany and Bohemia. His indifference to public business caused an outcry from his neglected subjects, quarrels in Bohemia led to the humiliation of a short imprisonment in 1394, and in 1400 four of the German electors declared him deposed there. He became a prisoner in the hands of his half-brother, Sigismund, but recovered his throne in 1404, and remained king until his death at Prague, Aug. 16, 1419.

Wenchow. Former treaty port in the S. of Chekiang prov., China. A walled city intersected by many tidal canals, it was opened to foreign trade in 1877. Pop. 215,815.

Wends. German name for all inhabitants of the area between Oder and Elbe. Their ancestors immigrated in the 8th-9th centuries, and the people have preserved Slavonic characteristics. In its scientific application, the name means the Sorbian pop. of Lusatia,

on the upper and middle Spree. These number about 120,000, of whom over half were registered in 1925 as still speaking their own language. They preserved, rather artificially as an attraction for tourists, their colourful, old-fashioned clothing, the women wearing huge white, starched bow caps and a whole range of skirts. Their allegedly closer relation to the Serbs than to other W. and S. Slavs has no scientific justification; their language contains Polish and Czech elements. They were Christianised by the Danes in 1168.

Wendigo. Supernatural being in the folklore of the N. American Indians. Longfellow rendered the word in his *Hiawatha* merely as giant, but the wendigo is frequently referred to as a vague, malevolent creature of waste places and storm.

Wendover. Town and parish of Bucks, England. Picturesquely situated among the Chiltern Hills, it is 5 m. S.E. of Aylesbury and 3½ m. by rly. N.W. from London. The parish church of S. Mary was restored in 1869, and contains several interesting monuments. The market house, in High Street, dates from 1842. Wendover was formerly a borough sending two members to parliament, but was disfranchised by the Reform Act of 1832. Among former M.P.s was John Hampden. In the neighbourhood is Chequers (*q.v.*). Pop. approx. 5,000.

Wendy. The mortal sweetheart of Peter Pan in Barrie's fairy story of that name. Wendy Moira Angela Darling visits Peter in the Never-Never-Land, acts as mother to the Lost Boys, and is provided with a log house in the wood. When she returns to her family after many adventures, she promises to revisit Peter for a week every spring. On the stage Hilda Trevelyan (*q.v.*) played the part many times from 1904.

Wener. Variant spelling for the Swedish lake Vänern (*q.v.*).

Wenlock. Mun. borough of Shropshire, England. It stands on the Severn, 14 m. S.E. of Shrewsbury, and is served by rly. The borough includes the market towns of Much Wenlock, Madeley, and Broseley. Its chief buildings are the church of Holy Trinity, a fine old building restored, and the guildhall, a half-timbered structure dating from 1589. There is an agricultural trade, and in the neighbourhood are coal and ironstone mines. Wenlock grew up around a religious house, and was made a borough in 1468. The present borough, however, which is

governed by a mayor and corporation, dates from 1835. Wenlock was given in 1468 the right to



Wenlock, Shropshire. The ancient half-timbered Guildhall, adjoining Holy Trinity Church
Frith

send two members to parliament, but lost one in 1867 and the other in 1885. There are remains of the church and chapter house of the abbey. Pop. approx. 15,000.

Near is the double limestone escarpment, 17 m. in length and 1,000-1,200 ft. alt., of Wenlock Edge; the steeper N.W. slopes are closely wooded, the gently sloping sides being farm land.

Wenlock Series. In geology, the middle division of the Silurian rocks of Great Britain. The rocks are typically developed in the W. of England, consist of limestones and shales, and are important sources of lime and flagstones. Fossil remains in the Wenlock series are numerous, including corals, trilobites, lamellibranchs, brachiopods, etc. See Silurian.

Wennerberg, GUNNAR (1817-1901). Swedish poet and composer. Born at Lidköping, Oct. 2, 1817, he was educated at Uppsala. In 1861 he went to Stockholm, and in 1870 became minister for education and public worship. Entering the Riksdag in 1875, he retained his seat till his death, Aug. 24, 1901. Wennerberg's chief interest lay in bettering national education, strengthening the defences, and in church reform. His strong personality and eloquence, added to his fame as a poet and musician, made him one of the most influential men of his day. He wrote and composed some of the finest patriotic songs in Sweden, and *Hear us, Sweden, Mother of us All*, has be-

come almost the national hymn of his country. His popular duets for baritone and bass called Gluntarne (The Boys), 1847-50, vividly describe life at Uppsala university.

Wensleydale OR YOREDALE. Valley of the river Ure (Yore) in the N. Riding of Yorks, England. It is unusual in taking its name not from the river, but from the grey stone village of Wensley, which has a 15th century bridge and an E.E. church. The dale begins below Jervaulx Abbey, is cultivated as far as Carperby, and preserves a pastoral character most of the way past Askrigg and Hawes to the Westmorland border.

Wensleydale Cheese. The upper valley of the Ure, Yorks, produces two cheeses. The lesser is a flat white cheese, eaten fresh, and made throughout the year. The greater is a worthy member of the family of lightly pressed, double-cream, blue-veined cheeses of which Stilton is the principal example. It is in cylindrical form, smaller than Stilton, and grows ripe slowly. The time for making it is summer and early autumn.

Wensum. River of Norfolk, England. It rises near Tattersett, in the N. of the co., and joins the Yare below Norwich, through which city it flows. Its course is mainly S.E., and its length is 30 m.

Wentletrap (Ger. *Wendeltreppe*, winding stairs). Popular name for marine snails of the large genus *Scalaria*, of which five species are found on the British coasts. The molluscs are cylindrical with a short squarish foot, the head with a retractile proboscis and slender tentacles, at the bases of which are the small eyes. When molested the creatures pour out a purple fluid from the mouth. They feed upon seaweeds, and are found chiefly in the warmer seas. See Mollusca.

Wentworth. Township of New South Wales, Australia. It stands at the junction of the Darling and the Murray, 720 m. W. of Sydney. An entrepôt for inter-state and riverine trade, it has an irrigation scheme to serve 10,000 acres under intensive culture.

Wentworth. Name of a famous English family, whose most distinguished member was the earl of Strafford (q.v.). Its founder was William Wentworth (d. 1308), of Wentworth Woodhouse. One of his descendants, Thomas (1501-51), was made a baron in 1529, being a court official of the Tudor sovereigns. Thomas, 4th baron, was made earl of Cleveland in 1626, but on his death in 1667 the earldom became extinct. Mean-

while the barony of Wentworth passed from one female to another. One of these was the wife of Lord Lovelace, and a later one was Anne, who married Byron. Their daughter, who became countess of Lovelace, inherited the Wentworth title, and from her death until 1906 it was held by the earls of Lovelace. On the death of the 2nd earl, the barony, separated from the earldom, passed to his daughter. She died in 1917, when Anne, daughter of the 1st earl of Lovelace and wife of the poet W. S. Blunt, became baroness; dying later in the year, she left the title to her daughter Judith, who married N. S. Lytton in 1899 (divorcing him in 1923). See Fitzwilliam, Earl; Wentworth Woodhouse.

Wentworth, WILLIAM CHARLES (1793-1872). Australian politician. Born Oct. 26, 1793, in Norfolk Island, and educated in England and Australia, he was called to the Sydney bar in 1823. He helped to found a journal, *The Australian*, in 1824, and became a leader in the agitation for self-government, being largely responsible for New South Wales gaining partial autonomy in 1842. The constitution of 1854 was likewise his work, and in 1861 he became president of the council. Retiring from politics next year, he died in England, March 20, 1872, his body being taken to Sydney and buried with public honours. He founded Sydney university.

Wentworth Woodhouse. Country mansion of Earl Fitzwilliam, in the W. Riding of Yorks, England. In the parish of Wentworth, 3½ m. N.W. of Parkgate rly. station, the mansion is in the Classic style, and stands in an extensive deer park. The building was designed by Flitcroft for the 1st marquess of Rockingham, and was erected on the site of an older house, once belonging to the Straffords; many Van Dycks

painted for the earl of Strafford are still exhibited in the modern mansion. The stables of the Fitzwilliam Hunt are in the grounds, as also are a mausoleum and a monument to Viscount Keppel. Open-cast mining on the estate, begun in 1943, yielded two million tons of coal before the ministry of Fuel in 1946 determined to continue operations close to the house, giving rise to bitter controversy on the question of amenities.

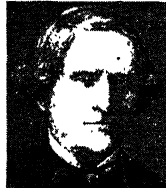
Weobley. Town and parish of Herefordshire, England. It is 8 m. S.W. of Leominster and 3 m. from Moorhampton rly. station. The parish church of SS. Peter and Paul, partly Norman, was restored in 1865. Black-and-white timber houses abound. The town formerly returned two members to parliament, but was disfranchised by the Reform Act of 1832. Pop. 625. Pron. Webley. See Porch.

Wepener. Town of the Orange Free State, S. Africa. Close to the border of Basutoland, it is 76 m. by rly. S.E. of Bloemfontein. The centre of an agricultural district, it dates from 1888. In 1900 it was defended against the Boers by a force of irregulars.

Werewolf (A.-S. *werewolf*, man-wolf; Ger. *Werwolf*). Person supposed to be able to transform himself into a wolf, and as such to prey upon human beings. Virgil describes a were-wolf in Eclogue 8. The belief is widespread (see Lycanthropy).

During the Allied advance into Germany in the Second Great War, an attempt to organize an underground movement called the Werewolf was made by the Nazi authorities. German broadcasting stations which pretended to be in the occupied territory, but were actually transmitting from the centre of Germany, called upon the civilian pop. to sabotage the Allied lines of communication. A few members of the Hitler Youth and similar bodies became active in Russian-occupied territory; otherwise the Werewolves did nothing.

Werfel, FRANZ (1890-1945). Austrian poet, novelist, and dramatist. Born of Jewish parents in Prague (then in Austria-Hungary),



W. C. Wentworth, Australian politician



Wentworth Woodhouse. East front of the Yorkshire mansion, built for the 1st Marquess of Rockingham

Sept. 10, 1890, he was educated at Prague and Leipzig universities. Publishing volumes of lyric poetry, he became a leader of the younger German writers. After serving in the First Great War he lived in Vienna. When Hitler seized power his books were banned in Germany and he was expelled from the Prussian academy of art. Going later to Lourdes, he derived inspiration for *The Song of Bernadette*, his most popular novel, written at Los Angeles in 1942, and successfully filmed in 1944. Werfel, who settled in California, died Aug. 26, 1945. His art went beyond Expressionism, penetrating to the deeper reality behind the facts. The dramatic trilogy, *Der Spiegelmannsch*, 1920, deals with the conflict in the human soul between aspiration and sensuality; a drama, *Paul Among the Jews*, 1926, suggested that Werfel had first abandoned Judaism and then avowed it again. His first important novel was *Verdi*, 1924. Between *Heaven and Earth* appeared in 1948. Werfel's poems were translated by Edith Snow, 1946.

Wergeland, HENRIK ARNOLD (1808-45). Norwegian poet. Born June 17, 1808, he began his career



H. A. Wergeland,
Norwegian poet

with a number of farces and plays. Among these are *Ah*, 1827; and *Irreparable Tempus*, 1828, which he wrote under the pseudonym of Sifuf Sifadda. In 1829 he published his *Poems*, first series, and in 1830 *Skabelsen, Mennesket og Messias* (Creation, Man, and the Messiah), a poem which was adversely criticised by J. S. Welhaven (q.v.). His dramas include *Cambellerne* (The Campbells), and *Venetianerne* (The Venetians). He died July 12, 1845. English versions of his poems did not appear until 1930.

Wergild (A.-S. *wer*, man; *gild*, payment). In A.-S. law, a fine inflicted as a penalty for murder or maiming. The amount, which had to be paid to the next-of-kin or gild brethren, in case of death, varied according to status, ranging from 7,200 shillings in relation to a king to 200 shillings for a ceorl.

Werner, ALFRED (1866-1919). Swiss chemist. He was born at Mulhouse, Alsace, Dec. 12, 1866, and educated at Zürich, where he became professor of chemistry in 1895. In cooperation with Hautsch

he did much brilliant research on stereo-chemistry, and evolved a theory of valency which was of great importance. For this he received the Nobel prize for chemistry in 1913. He continued as professor at Zürich until his death, Nov. 15, 1919.

Werner, ANTON ALEXANDER VON (1843-1915). German painter. Born at Frankfurt-on-Oder, May 9, 1843, he studied in Berlin, Karlsruhe, and Paris. In 1875 he became director of the Berlin Academy of Arts. He died in Berlin, Jan. 3, 1915. Of his many historical paintings, the best known are *The Capitulation of Sedan*; *The Meeting of Bismarck and Napoleon III*; *Moltke before Paris*; *Moltke at Versailles*; and *The Congress of Berlin*.

Wernher, SIR JULIUS CHARLES (1850-1912). Anglo-Jewish financier. Born at Darmstadt, he spent some time as a clerk in London, served in the Franco-Prussian War, and later went to South Africa, where he became associated with Alfred Beit in the diamond business. In 1884 Wernher settled in London as resident partner of the firm afterwards known as Wernher, Beit & co. He was associated with Rhodes in the management of the De Beers mines, and his firm was the biggest of those that controlled the diamond and gold-mining industries of South Africa. Having become a British subject after settling in London, he was made a baronet in 1905. He died May 21, 1912. See *Luton Hoo*.

Wernigerode. Town of E. Germany, in the *Land* of Saxony-Anhalt. It is situated 43 m. S.W. of Magdeburg on the slopes of the Harz Mts. It is remarkable for its many old buildings, including the town hall (1498), and the churches of S. Sylvester (13th century), S. John (1497), Our Lady (1762), S. Theobaldus (15th century), and S. George (14th century). Above the town is the palace where princes of Stolberg-Wernigerode, the former ruling dynasty, resided. The town was founded in the 9th century, and joined the Hanseatic League in 1267. In 1815 it was incorporated into Prussia, though some privileges were retained until 1876. Overrun by the U.S. 9th army in early April, 1945, after Germany's surrender Wernigerode came within the Russian zone of occupation. Pop. 37,000.

Werther. Principal character in the romance by Goethe, the full title of which is *The Sorrows of Young Werther*. Published in 1774, it had an extraordinary vogue and

has taken its place as a type of emotional or sentimental fiction.

Wesel. Town of W. Germany in the *Land* of North Rhine-Westphalia. It is on the right bank of the Rhine at the mouth of the Lippe, 32 m. N.W. of Düsseldorf. The *Berliner Thor* was a relic of the old fortifications. The 14th century town hall and the 15th century Gothic church of S. Willibrord were notable buildings. There were sugar-refineries and flour-mills. The town was virtually destroyed by bombing during the Second Great War; the retreating Germans blew up the huge bridge here across the Rhine in 1945. The British 1st Commando bde., first troops to cross the Rhine, in the evening of March 23, 1945, took Wesel before dawn next day (see *Rhine*: Second Great War). In 1945 Wesel came within the British zone of occupation. Pop. (1935) 25,124; (1950) 13,150.

Weser. River of Germany. The Fulda and Werra unite at Münden, Lower Saxony, forming the Weser, which flows tortuously for 800 m. N. across the N. German plain to enter the North Sea by an estuary 8½ m. across. The largest ocean steamers reach Bremerhaven, and smaller ones attain Bremen. The lower course is canalised in connexion with the Midland and other canals of N. Germany. The chief tributaries are the Aller and Hunte.

Wesermünde. Town and port of Germany. As a town it was created in 1924 by the amalgamation of Geestemünde and Leer, near Bremerhaven at the mouth of the Weser. For long one of the most important fishing centres in Europe, with extensive freezing, packing, and preserving plants, it handled 300,000,000 lb. of fish annually. It was heavily damaged during the Second Great War; afterwards it came into U.S. occupation as a port of entry for U.S. troops and supplies. From 1947 it formed part of the *Land* of Bremen (q.v.). Pop. (1946) 100,611.

Wesley, CHARLES (1707-88). English divine and hymn-writer.

Brother of John Wesley, he was born Dec. 18, 1707, and went to Westminster School and Christ Church, Oxford. At Oxford he and John gathered round them some 15 undergraduates who were the earliest Methodists.



C. Wesley

Ordained in 1735, he went to Georgia, and served Oglethorpe as secretary. Soon after his return to England, Wesley began to preach in various parts of the country, but, like his brother, he remained in the Church of England. He is better known, however, for his hymns, of which he wrote over a thousand, some of the most popular being *Jesu, Lover of my Soul*; *Christ Whose Glory Fills the Skies*; and *Love Divine, All Loves Excelling*. He died in London, March 29, 1788. Wesley's sons Charles (d. 1834) and Samuel (1766-1837) were both musicians of note. See *Hymns*; consult also *Life*, J. Telford, 1886; *Memorials of the Wesley Family*, G. J. Stevenson, 1876; C. W., *Evangelist and Poet*, F. L. Wiseman, 1933.

Wesley, JOHN (1703-1791). Founder of Methodism. He was born at Epworth rectory, June 17 (O.S.), 1703, fifteenth of the Rev. Samuel Wesley's nineteen children. Eight had died in infancy and only six were living when John was born. Samuel Wesley was educated for the Nonconformist ministry, but decided to join the Church of England and entered himself as a servitor at Exeter College, Oxford. He was rector of Epworth from 1697 till his death in 1735. His wife Susannah was the youngest child of Dr. Samuel Annesley, ejected from the vicarage of S. Giles, Cripplegate, in 1662. She joined the Church of England and married Samuel Wesley in 1689.

The outstanding event of John Wesley's boyhood was his rescue from the fire which destroyed the old rectory at Epworth, Feb. 9, 1709. In 1714 John entered Charterhouse school, in 1720 he was elected scholar at Christ Church, Oxford, and in 1726 fellow of Lincoln College. Wesley's father had admitted him to the communion when he was eight years old, but at school he became more negligent in his religious duties, though he still read the Bible and said his prayers morning and evening. In his first years at Oxford he was a gay and sprightly student with fine classical tastes, but no notion of inward holiness. Later he decided to take orders, and was ordained deacon in 1725 and priest in 1728. For some time he was his father's curate in Lincolnshire, but he was called back to Oxford to serve as tutor, and Lincoln College was his home till 1735. At Lincoln, about 1728, Wesley began that habit of rising at four o'clock, which he scrupulously observed to the end of his life. He was a diligent and care-

ful tutor, who tried to make those under his charge both scholars and Christians. His brother Charles had gathered round him at Christ Church a little society of earnest students, and when John came into residence he was recognized as the father of the Holy Club, or the Methodists, as they were called.



John Wesley

In 1735 John and Charles Wesley went to Georgia with two friends, Benjamin Ingham and Charles Delamotte. They reached Savannah, Feb. 5, 1736. The calm faith of the Moravians, with whom they sailed to America, had made a deep impression on Wesley's mind, and he spent much time among them in Georgia. His extreme "high church" attitude offended many, and his refusal to grant communion to a Mrs. Williamson, with whom, before her marriage, he had been half in love, led to a warrant for his arrest on a charge of defamation, and his subsequent indictment for improper ecclesiastical usages. In Dec., 1737, he set sail for England without standing his trial.

On May 24, 1738, Wesley attended a Moravian meeting in Aldersgate Street, London, where "I felt my heart strangely warmed. I felt I did trust in Christ, Christ alone, for salvation; and an assurance was given me that He had taken away my sins, even mine, and saved me from the law of sin and death." On April 2, 1739, he began to preach in the open air at Bristol. His converts were gathered into societies, and the work spread rapidly in London and Bristol. In 1742 Wesley found his way to Yorkshire and Newcastle-upon-Tyne. Methodism now began to

spread over England by leaps and bounds, Charles Wesley being as zealous and successful as John himself. George Whitefield's Calvinism separated him from them, but he was also a mighty evangelist, in both England and America. A band of lay preachers gathered round the Wesleys, and despite fierce persecution the work deepened and grew. Wesley sent two of his preachers to America in 1769, and in 1784 set apart Coke as superintendent of the work being carried on there.

Wesley generally travelled about 5,000 miles a year, and his itinerancy ceased only with his death. He is said to have delivered more than 40,000 sermons. He used the simplest words, but he spoke home to the heart and conscience, and the power of his appeals was sometimes overwhelming. He had a genius for organization and was quick to avail himself of every suggestion which might strengthen Methodism. He used the press with greater skill than any religious leader of that generation, and when his cheap books became popular he gave away his money lavishly. He was a social reformer who provided work for the deserving poor, opened dispensaries, and distributed medicines. Wesley preached his last sermon at Leatherhead on Feb. 23, 1791, and died in his own house in City Road, London, March 2. See *Epworth*; *Methodism*; *Savannah*; *Wesley's Chapel*; *Whitefield*, G.

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Wesley, SAMUEL SEBASTIAN (1810-76). British organist and composer. Son of Samuel Wesley (1766-1837), he was born in London, Aug. 14, 1810, played the organ as a boy in several London churches, and was appointed organist successively at Hereford cathedral, 1832; Exeter cathedral, 1835; Leeds parish church, 1842; Winchester cathedral, 1849; and Gloucester cathedral, 1865, remaining there until his death on April 19, 1876. He is in the front



*Samuel Wesley,
British organist*

rank of composers for the Anglican church, leaving services, anthems, hymn tunes, organ pieces, as well as songs and glees. Blessed Be the God and Father, and Thou Wilt Keep Him in Perfect Peace, are often sung. A Life, by J. T. Lightwood, appeared in 1937.

Wesleyan Methodist Church.

Title from 1891 to 1932 of the Church founded by John Wesley. See Methodism.

Wesley's Chapel. Historic London place of worship. Situated at 49, City Road, E.C.1, it was



Wesley's Chapel, London, and the statue of John Wesley, by J. A. Acton, erected in 1891

built in 1777-78 for John Wesley, from whose time onwards it was regarded as the cathedral of Methodism, though superseded by larger and more modern buildings, such as the Central Hall, Westminster, as the headquarters of the denomination's official assembly and organization.

Wessel, Horst. Nazi "hero" who gave his name to the Horst Wessel Song (*q.v.*).

Wessex. Kingdom of the West Saxons. It covered the country between the Thames valley and the S. coast, excepting the kingdoms of Kent and Sussex. The traditional conquerors and first kings, Cerdic and Cynric, were probably mythical personages, and history begins about A.D. 560 with Ceawlin, who carried his arms as far as the Bristol Channel, and by the victory of Deorham in 577 severed the Britons on the S.W. from the Britons in Wales. During the next 200 years the leading English kingdoms were first Northumbria and then Mercia, Wessex never holding the supremacy, though she had at least one distinguished ruler in Ine (688-726). In 802 Egbert became king of Wessex. In 825 he overthrew the Mercian kingdom, and in 829 was recognized as *Bretwalda*, high king or overlord of the other English kings.

Attacks by Danes or Northmen gradually developed, until by 870 they had practically mastered the northern kingdoms and East Anglia, and then began the struggle for Wessex, in which Alfred the Great proved victorious. At his death in 900, the king of Wessex was *de facto* lord of England on the W. and S. of a line drawn roughly from Chester to London, with a sovereignty, vaguely acknowledged, over the rest of the country, the Danelagh (*q.v.*). It remained for Alfred's son Edward the Elder

to translate this sovereignty into a definite mastery, and to make the king of Wessex *de facto* king of England, after which Wessex became merely a geographical expression. (See England: History.)

Thomas Hardy revived the name for the country he wrote about in what are often described as the Wessex novels. The centre of his kingdom was Dorset, but he often extended the scenes of his novels to Oxford and into Cornwall.

West. One of the cardinal points of the compass. At the equinox the point in the sky at which the sun sets is due west; and if an observer in the N. hemisphere faces the sun at noon, the west is to his right. By an obvious symbolism the lands of the sunset have been regarded by many peoples as the home of departed spirits; hence the euphemism "go west," for die. In N. America this phrase has borne a different meaning, for the expansion of civilization in both Canada and the U.S.A. has taken a generally westward direction. The West in a political and sociological sense implies the civilization of the older European nations with its emphasis on reason and science, as against the more fatalistic and mystical outlook of Asia. See Middle West.



Ben West

After G. H. Harlow

West, BEN-JAMIN (1738-1820). Anglo-American painter. Born at Springfield, Pa., of Quaker parentage, Oct. 10, 1738, he practised portrait painting in America and after three years in Italy

settled in England in 1763. In 1772 he was appointed historical painter to George III. One of the four artists selected to draw up the scheme of the R.A. in 1768, West succeeded Reynolds as president in 1792. His Death of Wolfe did much to establish the realistic treatment of historical episodes, and some of his 400 scenes are at the National Gallery and Hampton Court. He died in London, March 11, 1820. See Boyne, Battle of the; Cromwell illu s. p. 2477; Fulton, R.; Penn, W.

West, MAE (b. 1892). American actress. Born in Brooklyn, Aug. 17, 1892, she went on the stage in all the standard juvenile parts and into the Folies Bergère, N.Y., in 1911. Specialising in revue, she took the lead in Sex, 1927 (a pro-



Mae West, American actress

secution following), and next year created a furore with Diamond Lil. Her flamboyancy, suggestiveness, drawing voice, and exploitation of fashionable feminine "curves"

led to great success in films from 1932, especially I'm No Angel. In 1944 she returned to the New York stage after 13 years' absence. Diamond Lil was revived by her in London in 1948. Mae West wrote nearly all her own shows. The R.A.F. life jacket was named after her. See "Mae West."

West, REBECCA (b. 1892). British author. Cicily Isabel Fairfield was born in Kerry at Christmas, 1892, and attended George Watson's ladies' college, Edinburgh. In 1930 she married H. M. Andrews. Her journalistic career began in 1911 with a



Rebecca West, British author

post on Freewoman, from which she soon moved to the Clarion. Influenced by H. G. Wells, whom she in return influenced, she became a controversial writer and critic of force and originality. Early novels included The Return of the Soldier, 1918; The Judge, 1922; among literary studies were Henry James,

1916; and D. H. Lawrence, 1930; also *The Strange Necessity*, 1928, and *The Thinking Reed*, 1936. Black Lamb and Grey Falcon, 1942, described Yugoslavia. For *The Meaning of Treason*, 1948, which described British treason trials after the Second Great War, Rebecca West received an international award in Washington.

West Africa, BRITISH. Political term which includes the four British colonies of Gambia, Gold Coast, Nigeria, and Sierra Leone. Each is separately described.

West Africa, FRENCH. Overseas territory of France, bounded N. by Morocco, Algeria, Tunisia, and Libya; W. by the Atlantic Ocean, British, Spanish, and Portuguese colonies, and Liberia; S. by the Gulf of Guinea, Gold Coast, and Nigeria; and E. by French Equatorial Africa and the Anglo-Egyptian Sudan. Within this area is included the greater portion of the Sahara and the Sudan. French W. Africa is divided into eight colonies—Dahomé, French Guinea, Ivory Coast, Mauritania, Niger, Senegal, French Sudan, Upper Volta—each administered by a governor; and the whole is under the control of a governor-general, with headquarters at Dakar (*q.v.*). Area, 1,815,768 sq. m. Pop. 15,996,000.

West Africa, PORTUGUESE. This colony of Portugal is also called Angola and so indexed.

West African Frontier Force, ROYAL. British colonial military formation. Established in 1901, it consists of the Nigeria, Gold Coast, Sierra Leone, and Gambia regts., all of which had been formed in 1897 by Col. Sir F. (later Lord) Lugard to maintain order amongst the then warring tribes of the British West African dependencies. The force is financed by the British govt. and is voluntarily enlisted; it includes members of most of the W. African tribes. The majority of native personnel are Mahomedans.

European officers, warrant officers, and senior N.C.O.s are seconded from the British army, there being one white sgt. to each platoon. There are a certain number of native N.C.O.s and W.O.s, but these have no authority over Europeans. A limited number of commissions are granted to W. Africans. The force has its own signal, transport, engineer, armoured, and artillery detachments manned by native personnel. Uniform consists of khaki drill blouse and shorts, and felt slouch hat bearing the force's palm tree badge and the letters R.W.A.F.F.



West African Frontier Force badge

During the Second Great War the R.W.A.F.F. had 160,000 African privates and N.C.O.s, and 16,000 European officers and senior N.C.O.s. Brigades served in Somaliland, Abyssinia, and the Middle East. The Gold Coast regt. formed the main assault column at the capture of El Wak in Dec., 1940, and was one of the units to invade Italian Somaliland, bearing the brunt of the fighting across the Juba. Two R.W.A.F.F. divs., the 81st and 82nd, served in the Burma campaign. The 81st arrived in India in 1943, the first native African formation to serve outside Africa; it included the Nigeria regt., which served in the Chindit operations of 1944. Its divisional emblem was a spider. The 82nd div., which arrived in India in 1944, had as emblem crossed assegais and head roll; it fought in Arakan, capturing Mowdok, Oct. 8, 1944.

A special decoration, the R.W.A.F.F. distinguished conduct medal, is awarded to native and European personnel who distinguish themselves in action. There is also a R.W.A.F.F. long service and good conduct medal.

West Bengal. State of the Union of India, formed 1947 from the former Bengal province. It includes all the territory in the former prov. lying roughly W. of a line drawn from the mouth of the Hariabhanga river to the point on the Padma, tributary of the Ganges, opposite Sarda (which stands in E. Bengal, Pakistan). Thence the boundary takes a N.W. direction along the Ganges to a little W. of Sibganj, and then it moves N.E. from the Ganges to a point near Hilli (E. Bengal), turning again N.W. to the Nagar river, which it reaches a few miles E. of Barsoi in Bihar. There is an enclave farther north, mainly based on the Darjeeling and Jalpaiguri districts.

Westbourne. Former tributary of the Thames, which in 1834 ceased to be an open stream. It rose at Hampstead and flowed generally S. through Kilburn and Paddington, crossed Bayswater

In the First Great War, 17,000 men served in the W.A.F.F., which had a major part in the conquest of Togoland and the Cameroons. The force was given the prefix Royal in 1928.

Road, and passed through the depression that is now the Serpentine. A fragment of the old course may still be seen in the shape of an iron pipe at Sloane Square underground rly. station. At Pimlico the Westbourne has become the Ranelagh sewer which enters the Thames W. of Chelsea Bridge. It gave its name to the Westbourne Park and Westbourne Grove dist. of Paddington.

Another Westbourne is a suburb of Bournemouth, the W. terminus of the trolley bus system.

West Bridgford. Urban dist. of Notts, England. It stands on the S. of the Trent and is connected by Trent Bridge with the city of Nottingham. Here is a famous cricket ground used for international and county matches; another ground came to the council on the death of its owner, Sir J. Cahn. West Bridgford was the first urban dist. in England to supply its own passenger transport services. The parish church of S. Giles, restored 1872, shows fine examples of ancient and modern architecture and furnishings. The Luttrell family, now settled at Dunster, Somerset, appear to have held the manor until the mid-14th century. Pop. 23,000. East Bridgford is a village lying 7 m. down the Trent.

West Bromwich. Co. bor. and market town of Staffs, England. Situated 6 m. N.W. of Bir-



West Bromwich arms

mingham, with a rly. station, it is the centre of a busy mining and manufacturing district, and is well served by rlys. and canals. The parish church of All Saints was entirely rebuilt in 1872. Other edifices are the town hall, 1874-75, with a clock tower 130 ft. high; the market hall; the institute; and the old half-timbered Oak House, formerly a residence of the Turton family, and now a public museum. Dartmouth Park is a public recreation ground. The principal trade is in ironwork; there are smelting furnaces and foundries, and brickmaking, tar distillation, and making springs are some of the more important industries. Forming a bor. constituency, West Bromwich sends one member to parliament. Market day, Sat. Pop. 85,870.

West Bromwich Albion. Professional Association football club. Founded in 1879 under the name of West Bromwich Strollers, the

team originally played in Dartmouth Park, their present ground being the Hawthorns in Birmingham Road, West Bromwich. After several successful seasons as an amateur organization, they adopted professionalism in 1885, and three years later joined with eleven other clubs to form the Football League. They have four times been relegated to the second division, in 1901, 1904, 1927, 1938; and secured promotion to the first in 1902, 1911, 1931, 1949. In 1920 they won the first division championship, and they carried off the F.A. Cup in 1888, 1892, and 1931. Their colours are dark blue and white striped shirts, with white shorts.

Westbury. Market town and urban dist. of Wilts, England. It stands on the Biss, and is a



Westbury, Wiltshire. Parish church of All Saints

rly. junction 96 m. W. by S. of London. The chief building is the fine Perpendicular church of All Saints. Westbury is supposed to have been a residence of the kings of Wessex, the site of their palace being still shown. It was a corporate town in the Middle ages, had two M.P.s until 1832, then one until 1885, and now gives its name to a co. constituency. At one time it was a centre of cloth manufacture, holding fairs and markets. It still trades in agricultural produce, and has a cement factory. Cut on Bratton Hill in 1778, the Westbury white horse, one of the famous downland chalk figures, measures 175 ft.

Westbury, RICHARD BETHELL, 1st BARON (1800-73). British lawyer. Born at Bradford-on-Avon, June 30, 1800, and educated at Bristol and Wadham College, Oxford, he was called to the bar at the Middle Temple in 1823. In 1840 he became a Q.C. and was soon a leader of the chancery bar. In 1851 Bethell entered the Commons as M.P. for Aylesbury, and next year was solicitor-general in the Liberal ministry. Having been attorney-general, 1856-58 and

since 1859, he became lord chancellor in 1861, succeeding Campbell and was made a baron. Westbury was a zealous law reformer, taking a special interest in the codification of statutes. He died July 20, 1873. He is remembered by pithy expressions, and once, when the horses of his carriage bolted, urged the coachman to "drive into something cheap." The title came in 1930 to Richard Bethell (b. Oct. 9, 1914), 4th baron.

West Chester. Borough of Pennsylvania, U.S.A., the co. seat of Chester co. Situated 26 m. W. of Philadelphia, it is served by the Pennsylvania rly. Red brick mansions and huge oaks line the streets. There are a grain elevator, planing mills, and manufactures of farm implements. Pop. 13,289.

Westchester Cup. Contest at polo between England and the U.S.A. First played at Hurlingham in 1900, when England won, it was an irregularly held event up to 1914. During 1921-30 it became a triennial event, the U.S.A. winning at each meeting, as they did also in 1936 and 1939.

Westcliff. For this Essex seaside resort, see Southend.

Westcott. Hamlet of Bucks, England. In the parish of Waddesdon, it is situated on Akeman Street, 6 m. N.W. of Aylesbury. Here an aerodrome was established in 1943 for training R.A.F. air crew, and taken over by the ministry of Supply in 1946 as a research station for the development of war rockets. The establishment has laboratories devoted to experiments on combustion chambers; combustion kinetics; heat transfer; and fuels. Much preparatory work in connexion with missiles for the Australian rocket range at Woomera (q.v.) was carried out at Westcott.

Westcott, BROOKE FOSS (1825-1901). British divine. Born near Birmingham, Jan. 12, 1825, he was educated at King Edward's

school there and at Trinity College, Cambridge, of which he became a fellow after a brilliant career. Ordained in 1849, he was a master at Harrow from 1852



B. F. Westcott, British prelate

to 1869, when he was appointed canon of Peterborough. In 1870 Westcott became professor of divinity at Cambridge, in 1883 canon of Westminster, and in 1890 bishop of Durham. He died July 27, 1901. Westcott was one of the greatest Biblical scholars of his time, and also successful as a bishop. His greatest work was done on the N.T.; he wrote History of the N.T. Canon, 1855, while with Hort he prepared an edition of the testament, and was one of its revisers. He took a keen interest in social questions and missionary work. *Consult* Life, B. F. Westcott, 1903; J. Clayton, 1906.

Westerham. Market town of Kent, England. It is 5 m. by rly. W. of Sevenoaks. The parish church of S. Mary is a Perpendicular edifice containing interesting monuments to local families. Below the church is Quebec House, where Gen. James Wolfe, born at the vicarage, spent his early years. The house now contains a large collection of Wolfe relics, and a statue to him stands on the green. Market day, Wed. Pop. 3,368.



Westerham, Kent. The statue of Gen. James Wolfe, who was born in the vicarage close by

To the S. is Chartwell, home of Winston S. Churchill. Near the town is the village of Westerham Hill, situated on the highest ground in Kent; Biggin Hill (q.v.) is also in the vicinity.

Westermarck, EDWARD ALEXANDER (1862-1939). Finnish sociologist. Born at Helsingfors (Helsinki), Nov. 20, 1862, and educated there, he made an international reputation with his book on the

History of Human Marriage, written in English and published in London in 1891. A fifth edition, rewritten, was published in three vols. in 1922. In 1906-08 appeared, also in English, *Origin and Development of the Moral Ideas*. Westermarck spent much of his time in England, and during 1907-30 was professor of sociology in London university. His memoirs appeared in English in 1930. Westermarck died Sept. 4, 1939.

Western, SQUIRE. Character in Fielding's novel, *Tom Jones*. Presented as uncouth in speech, broad-humoured, quick-tempered, and a hard drinker, he is taken as a fair portrait of the typical English squire of the 18th century. Sophia Western, heroine of the story, is his daughter, and his manner towards her is also characteristic of the period.

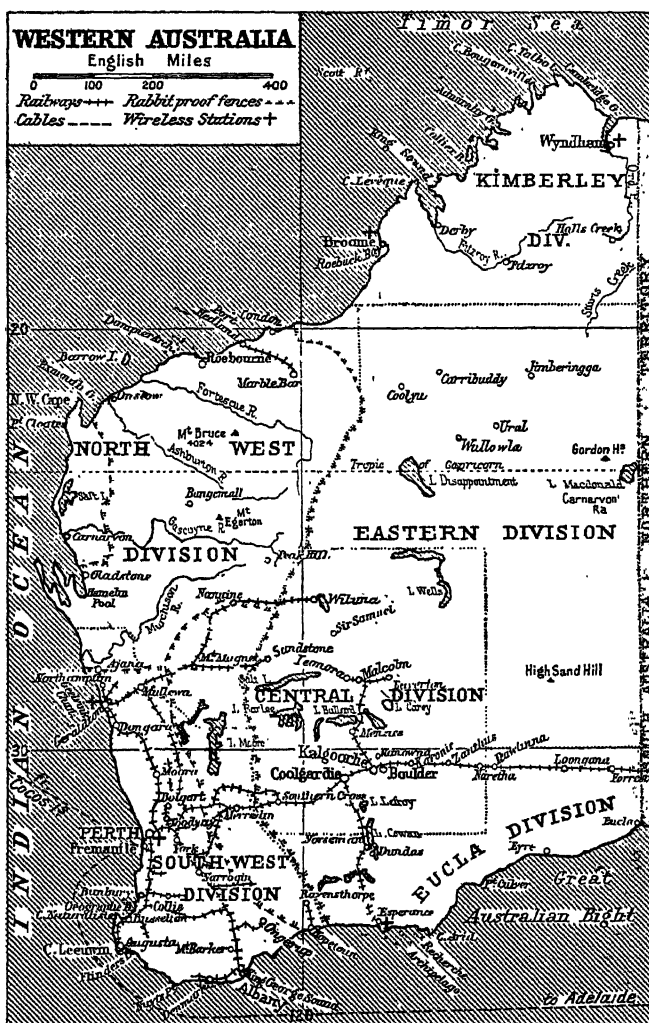
Western Approaches. Term applied in both Great Wars to the shipping lanes of the Atlantic where they enter British home waters. The N.W. approaches include the routes followed by vessels from Canada and the U.S.A.; the S.W., routes from Central and S. America, Africa, and the Far East. After the defeat of France in the Second Great War, German submarines, and to a lesser extent aircraft, operating from bases on the Atlantic seaboard of occupied Europe, attacked Allied shipping here, and in 1941 Western Approaches Command was formed under Admiral Noble to coordinate defence. See *Atlantic Battle*.

Western Australia. State of the Australian commonwealth, comprising the W. portion of the island. It lies W. of meridian 129° E., has an area of 975,920 sq. m.



Western Australia arms

W. Australia is a plateau at an average level of 1,300 ft. On the W. side, especially in the Kimberley and N.W. divisions, are elevated parts of the plateau, where peaks rise above 2,000 ft. The highest points are Mt. Bruce, 4,024 ft., and the Stirling Range, 3,640 ft. The middle of the state has a rainfall of less than 10 ins. and is a desert where the chief sign of life is the spinifex, a mass of prickles reaching a height of 2 ft. with coarse grass above this for another 4 ft. Across this region of drought stock routes have been



discovered, for water may be obtained by digging wells. To the N. rainfall increases to 30 ins. near Wyndham, and S.W. to 40 ins. near Cape Leeuwin. This rainfall is insufficient for large rivers; N. of Ninety Mile Beach the Fitzroy is the largest; S. of it occur the Fortescue, Murchison, and Swan. The Kalgoorlie goldfield obtains its water by pipe-line from the coast. On the W. coastal strip the annual range of temp. is less than 20° F., compared with over 30° F. in the interior, where frosts occur as far N. as the tropics.

It is probable that a Dutch navigator, Dirk Hartog, who in 1616 sailed along a considerable part of the W. coast, was the first discoverer of Western Australia. The English first appeared on the Australian coast in 1688, when

Dampier landed on Shark Bay. Both the Dutch and Dampier were repelled by the desolate sand-dunes of New Holland (the name given by the Dutch). There was no permanent settlement until 1829, when land near the Swan river was annexed for Gt. Britain by Fremantle, and Stirling founded the Swan river colony where Perth and Fremantle now stand. Not until 1890 had the country responsible govt. Australian federation in 1901 found W. Australia divided, with a strong minority against entering the commonwealth which continued to work for secession until the Second Great War.

The event of greatest economic importance was the discovery of gold in the Kimberleys in 1885. In 1893 the famous golden mile at Kalgoorlie was discovered, still one

of the richest mines in the world. The total value of Western Australian gold production up to 1945 was nearly £300,000,000. Other important minerals include coal and pyrites. Sheep breeding for wool and the overseas fat lamb market is important, the number of sheep exceeding 10,000,000. Dairy produce for export is of increasing value. Wheat, oats, and barley are grown on a large scale, as are apples. Timber is taken from the extensive forests. At Shark Bay there is a pearl-shell fishery.

Perth, the capital, has a pop. of over 200,000; Fremantle has 27,000; most of the other townships, except Kalgoorlie, Boulder, Bunbury, and Geraldton, have fewer than 5,000 people. Total pop. (1948 est.) 523,330.

W. Australia is represented in the commonwealth parliament by ten senators and eight representatives. The local parliament, under a governor who represents the crown, comprises a legislative council of 30 members and a legislative assembly of 50 members, all of whom are elected; a cabinet of responsible ministers controls the administration. *Consult W.A.: A History*, J. S. Battye, 1924; *W.A., 1829-1929*, H. P. Colebatch, 1929; *An Empty Land*, J. W. Kirwan, 1934.

Western Australia, UNIVERSITY OF. Institution established and endowed by the state legislature in 1911, and opened in 1913. The buildings are at Perth, and the faculties are arts, science, and engineering.

Western Desert. Term applied to the part of the Libyan desert which lies within Egypt. It is an arid region of sandy dunes, except in a few coastal districts and oases. The principal oases, Bahariya, Siwa, Dakhla, Kharga, and Farafra, receive their water from a sandstone bed about 400 ft. below the surface. Geographically the Western Desert is the inner portion of the Libyan and Sahara deserts. It has an est. pop. of 70,000, mostly nomadic Beduin, who raise camels and small cattle. The only towns are Mersa Matruh and Sollum. It was first called the Western Desert in the First Great War, when the British were fighting the Senussi, to distinguish it from the Sinai, or Eastern Desert, where other operations were taking place. In the Second Great War it formed the last British defence against the Axis invaders of Egypt, and at Alamein the springboard for the campaign that eventually drove the Axis out of N. Africa.

By extension the term Western Desert was then sometimes applied to the desert within Libya also. *See North Africa Campaigns.*

Western Front. Term used during the First and Second Great Wars for the land battle zone in Europe to the W. of Germany.

Western German Republic. Federal republic formed 1949 in the British, U.S., and French zones of occupation in Germany. Area 94,634 sq. m. Pop. 47,254,900. Capital, Bonn. *See Germany in N.V.*

Western Union. Military, economic, social, and cultural alliance between the U.K., France, and the Benelux countries (Belgium, the Netherlands, and Luxembourg). This came into existence as the result of a 50-year treaty, signed at the Brussels Palais des Académies, March 17, 1948. Subsequently the following representative bodies were set up: (1) a permanent consultative council, consisting of the five foreign ministers, meeting at least once every three months; (2) a permanent organ of the council, consisting of diplomatic representatives, meeting at least once a month; (3) a military committee, consisting of the five defence ministers; (4) a finance committee, consisting of the five finance ministers; (5) a committee to consider steps for the further promotion of European unity. The military committee set up a permanent organization, consisting of the following committee of commanders-in-chief, together with high-ranking officers of the nations not otherwise represented:

F.M. Viset, Montgomery (U.K.), permanent mil. chairman; Gen. de Lattre de Tassigny (Fr.), c.-in.-c. land forces, Western Europe; Air Marshal Sir J. Robb (U.K.), c.-in.-c. air forces, Western Europe; Vice-Adm. R. Jaujard (Fr.), flag officer, Western Europe.

A motion in the U.S. senate, July, 1948, expressed the principle of U.S. military support for the Western Union, and later U.S. service representatives assisted the work of the Western Union military committee in London. The North Atlantic treaty powers who in 1949 pledged mutual assistance and defence included all the Western Union countries, and in Dec., 1950, the military side of the Western Union alliance was merged in the North Atlantic treaty organization. *See in N.V., Europe; North Atlantic Treaty.*

Westfield College. London college for women. It was founded in 1882 for the preparation of women for degrees of the

university of London, of which it is a constituent college. Its buildings are at Hampstead. There are some 200 students.

Westgate-on-Sea. Town and seaside resort of Kent, England. It is 2 m. W. of Margate, with a rly. station, and is built on the two sides of a promontory. Pop. 4,500.

West Ham. Co. bor. of Essex, England, part of Greater London. Extending to the Thames with the



West Ham arms

Lea for its W. boundary, it is an industrial centre, inhabited almost wholly by working people employed in the rly. shops at Stratford, at the docks, and in soap, sugar, and other manufacturing establishments. The church of All Saints, parts of which are very old, has interesting monuments. West Ham Park, 80 acres, formerly the property of the Gurneys, has been public since 1874. Before the Second Great War this was the tenth biggest town in England, with pop. 294,278; during that war one quarter of the houses was destroyed by bombing, and afterwards the bor. was re-planned as 16 neighbourhood units, with 10,000 pop. in each. Its former four M.P.s were reduced to two by the Act of 1948.

West Hartlepool. Co. bor. of Durham, England. It stands just S.W. of Hartlepool, being 245 m. N. by W. from London, and is served by rly. The principal buildings are the town hall, market hall, public library, Athenaeum, and several modern churches. The borough includes Seaton Carew, a watering-place, and Stranton with an old church—All Saints. West Hartlepool is entirely a modern seaport, dating from the opening of the Durham coalfields. With Hartlepool (*q.v.*) it has a fine large harbour, protected by a breakwater. It includes docks which cover over 350 acres. Timber, iron ore, and sugar are among the imports. Large shipbuilding yards, engineering works, and saw and flour mills are among the other industries. The Hartlepoons together elect an M.P. Market day, Sat. Pop. 68,134.

Westhoughton. Urban dist. giving its name to a co. constituency, of Lancs, England. Lying 5 m. E. of Wigan, it has five rly. stations. There are cotton factories, manufacturing chemists, and large collieries. Pop. 16,018.

West India Regiment. Former regiment of the British army. It originated in 1778 as the South Carolina Corps, consisting of volunteers, white and black, raised to fight the French in the West Indies. It received its later name in 1798 and took part at



West India Regiment badge

Briar Creek, Stone Ferry, and Eutaw Springs in the closing years of the American War. It helped to defend Dominica, 1805, to capture Martinique, 1809, and Guadeloupe, 1810. Later service included quelling the rebellion in Jamaica, and the Ashanti War. During the First Great War the regiment went to Egypt, Palestine, and took part in the conquest of Cameroons. In 1926 it was disbanded. See British West Indies Regiment.

West Indies. An archipelago between N. and S. America. It separates the Atlantic Ocean from the Caribbean Sea and the Gulf of Mexico, and is divided into the Greater and Lesser Antilles. It includes 40 inhabited islands, with a total area of some 100,000 sq. m., two-thirds of which comprise the islands of Cuba and Haiti.

The Greater Antilles consist of Cuba, Haiti, Jamaica, and Puerto Rico; these islands contain mountainous cores, which represent the unsubmerged portions of an older continental land mass, Antillia.

The Lesser Antilles consist of three chains of islands and islets; the outer Caribbees, inner Caribbees, and Coralline islands. The outer Caribbees, mainly the Virgin Islands, Antigua, Tobago, with parts of Guadeloupe, Barbados, and Trinidad, continue the mountain system of Antillia to connect with the mountains of Venezuela. The inner Caribbees, Montserrat, Dominica, Martinique, St. Vincent, St. Lucia, Margarita, and Curaçao, etc., are young volcanic islands.

The Coralline islands, Barbuda, the Bahamas, and parts of Trinidad and Barbados, form an outer chain on the Atlantic margin. Temperatures are always high, rain falls at all seasons, especially on the windward slopes, the lowlands are forested, and the fauna is akin to that of S. America. At Kingston, Jamaica, mean temperatures only from 77° F. in Jan. to 82° F. in July, and rainfall is 34 ins. Terrible hurricanes may occur, especially in Sept.-Oct. The aborigines, Arawaks and Caribs, have almost entirely disappeared, the present pop. including Europeans, negroes, and half-breeds, with a few Indian coolies. Sugar, tobacco, fruits, spice, cacao, and dyewoods are the chief products.

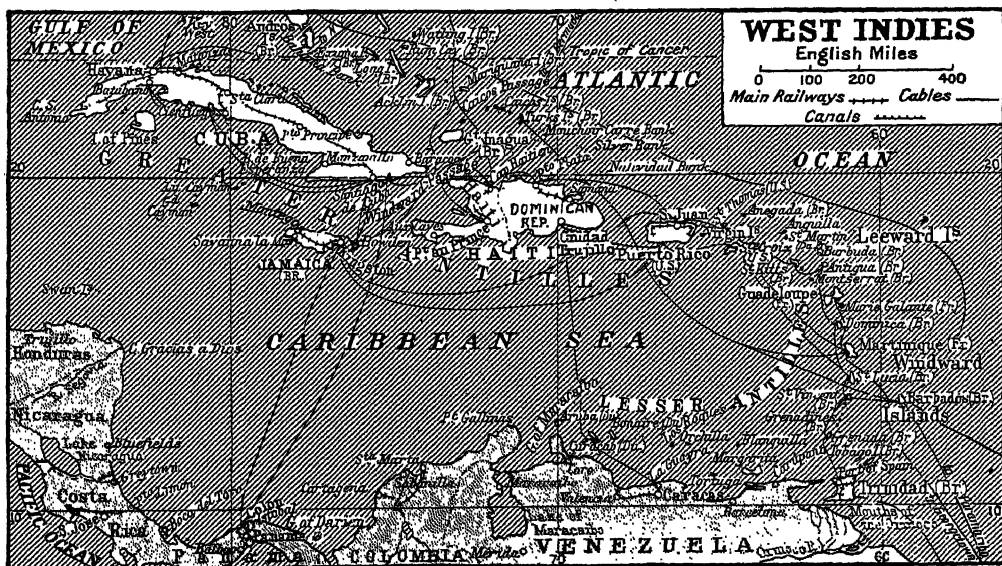
Politically two facts are predominant, American penetration and British colonial expansion. American penetration has been active since 1898 and the Spanish-American War; Cuba was for long virtually an American protector-

ate; Puerto Rico was annexed in 1898; the Dominican Republic and Haiti, though independent, show many signs of U.S. influence; and the Virgin Islands, formerly the Danish West Indies, were purchased from Denmark by the U.S.A. in 1917. In 1940 sites in the Bahamas, Jamaica, Trinidad, Antigua, and St. Lucia were leased to the U.S.A. for 99 years for the construction of military bases.

The British West Indies comprise six groups: Bahamas, Barbados, Jamaica with Turks Islands, Leeward Islands, Trinidad and Tobago, and Windward Islands. Martinique, Guadeloupe, St. Pierre, and Miquelon are French; Curaçao is Dutch; Margarita belongs to Venezuela. Details concerning the several islands will be found in articles under their names.

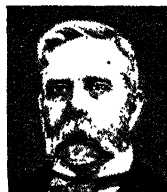
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Westinghouse, GEORGE (1846-1914). American engineer and inventor. Born Oct. 6, 1846, at Central Bridge, N.Y., he entered his father's machine-manufacturing business. In 1864 he became assistant engineer in the U.S. navy, and after graduating at Union College, Schenectady, became known as an ingenious inventor. He devised improvements in the system of signalling. In 1869 he brought out the rly. brake known



West Indies. Map of the large American archipelago which separates the Atlantic Ocean from the Caribbean Sea

by his name, which was adopted throughout the U.S.A., in Great Britain, and on many European lines (see Brake).



G. Westinghouse, American inventor

Westinghouse inaugurated the use on a large scale of A.C. for lighting and power, and the transmission of electric current over long distances. He founded large power plants and workshops at Pittsburgh, and was responsible for the electrical equipment of the London Metropolitan rly. President of the American Society of Mechanical Engineers, 1910, he died March 12, 1914.

West Kent Regiment, QUEEN'S OWN ROYAL. A regiment of the British army. Raised in 1755 as the 50th Foot, it went on garrison duty in India and the West Indies.



West Kent Regiment badge

Converted into a marine unit, it won its first battle honour under Nelson at Copenhagen in 1807. The regiment again became infantry to serve in the Peninsular War, winning particular distinction at Vimeiro; at that time the regimental facings were black, and in the heat of battle the men wiped their faces with their cuffs, so blackening their skins, hence their nickname of Dirty Half Hundred. In 1827 the 50th Foot was called the Duke of Clarence's West Kent Regiment, but when the duke became William IV in 1830 the title was changed to the Queen's Own. The West Kents fought in the Crimea at the Alma and Inkerman and led the assault on the Redan. They were at the relief of Lucknow and in the Maori War of 1864.

In 1881 the West Kents absorbed as their second battalion the 97th Foot, which had been raised in 1824 as the Earl of Ulster's regiment. Both battalions served in the Gordon relief expedition, and the regiment was represented by one battalion in the S. African War. Eighteen battalions were raised for the First Great War, gaining the battle honours: Mons; Ypres, 1914, '15, '17, '18; Hill 60; Somme, 1916, '18; Vimy, 1917; Italy, 1917; Gallipoli, 1915; Gaza; Defence of Kut; Sharquat. In the Second Great War the regiment was in the defence of Arras, 1940;

in Burma, where heavy casualties were sustained near Kohima; in the defence of Leros and Cos; and in the liberation of N.W. Europe. The regimental depot is at Maidstone, and the badge depicts the white horse of Kent.

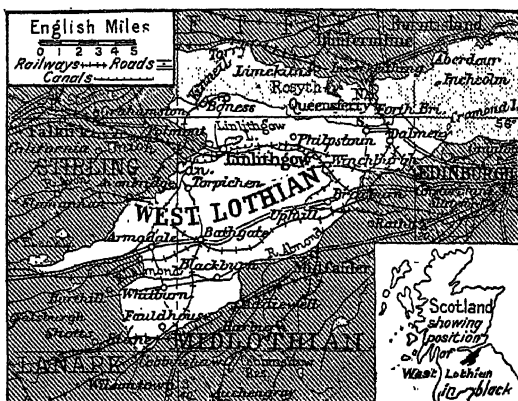
West Kilbride. Town

and seaside resort of Ayrshire, Scotland. It stands upon Kilbride Burn and is 30 m. by rly. W. of Glasgow. It has two fine churches, and several institutions for invalids. The town is a popular holiday centre. An outstanding landmark is Portencross Castle, where is an ancient cannon washed up from the wreck of a Spanish galleon at the time of the Armada. Pop. 3,946.

West Kirby. Seaside resort of Cheshire, England. It stands on the Dee estuary, in the Wirral peninsula, 8 m. W. by S. of Birkenhead, and has a rly. station. Here is a partly Norman church with timber altar. Pop. 16,628.

Westland. Provincial dist. of South Island, New Zealand. It lies along the W. coast, averaging 27 m. in width and 250 m. in length, and having an area of 4,880 sq. m. Here is Mt. Cook, the highest point in the Southern Alps (12,349 ft.). Cattle rearing and some dairying are carried on, and there are numbers of sawmills. Westland contains the Brunner coal area, for which Greymouth is the port. Pop. est. 17,700.

West Lothian. County of Scotland. Its area is 120 sq. m., and it has a coast-line of about 17 m. on the Firth of Forth, being bounded E. by Midlothian and W. by Lanarkshire and Stirlingshire. The surface varies from the low coast belt to the undulating and hilly region of the interior, where there are elevations of over 1,000 ft. The only rivers of any size are the Avon, on the Stirlingshire border, and the Almond, separating W. Lothian from Midlothian. Linlithgow Loch is the only lake. Agriculture is the staple industry, oats being the chief crop. Wheat, barley, and grasses are also grown, and there are a number of dairy farms. There are large quantities of coal



West Lothian. Map of the Scottish county formerly called Linlithgowshire

and iron ore, while oil is extracted from shales here. The co. is served by rlys. and the Union Canal. The chief town is Linlithgow; others are Broxburn, Borrowstounness or Bo'ness (the chief harbour), Bathgate, and S. Queensferry, whence the Forth Bridge goes to Fife. Small industrial centres are Arma-dale, Uphall, Kinneil, Whitburn, and Winchburgh. There are some antiquarian remains in the county, but outside Linlithgow not a great deal of historical interest. The co. with all its burghs forms one co. constituency. Pop. 86,000.

Westmacott, SIR RICHARD (1775-1856). British sculptor.

Born in London he studied in Rome under Canova, returning home in 1797. He became A.R.A. in 1805, R.A. in 1811, and was knighted in 1837. The reliefs on the Marble Arch, London, are his work, and he executed the colossal so-called Achilles statue in Hyde Park. He died in London, Sept. 1, 1856.



Sir Richard Westmacott, British sculptor After J. Derby

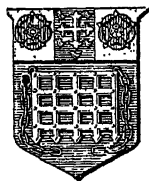
Westmark. Name given in 1940 by the Nazis to Lorraine, the Palatinate, and Saarland. Saarbrücken was the capital, and the R.C. diocese of Metz was abolished. Like Ostmark (Austria) on the other side of the Reich, it was supposed to represent a bastion of Germanic culture against that of other peoples (*Mark*=march; cf. marches, meaning border country).

Westmeath. County of Leinster, Eire. With a land area of 681 sq. m., it is wholly inland. It lies chiefly in the basin of the Shannon, which river, with Lough

Ree, forms its western boundary. The other chief rivers are the Brosna, Inny, and Dale; the largest of many lakes are Sheelin, Kinala, Derravaragh, Owl, Lene, Ennell, and Glone. The surface is varied between hill and valley, and is in parts boggy. The pasturing of sheep, cows, horses, and other animals forms the chief industry. There is some textile industry, the manufacture of flannels and coarse linens. The county is served by rlys. and the Royal and Grand Canals. With co. Longford it returns five member to the Dáil.

Mullingar is the county town; other places are Athlone, Castlepollard, and Moate. Westmeath was originally part of Meath, being made a separate county in 1543. Of its many antiquities, the chief are the ruins of Multyfarnham Abbey. Pop. 54,880.

Westminster. City and met. bor. of the county of London. The name West Minster first occurs in a charter of King



Westminster arms

formed by two outlets of the Tyburn and a cross-ditch, the E. boundary being the Thames. Of these outlets the southern crossed the S.W. corner of what is now Dean's Yard and ran the length of Great College Street to turn the Abbey Mill at the end, while the northern entered the Thames about the end of Cannon Row, the cross-ditch running along Great Smith Street.

The establishment of a royal palace at Westminster in the reign of Canute, or possibly earlier, contributed, with Edward the Confessor's new church and monastery, to the early growth of the town, the first highways of which were King Street from Charing village to the Palace and Tothill Street from the Abbey westwards. An increasing population necessitated the building of the first church of S. Margaret about 1100, to be followed by larger edifices in the reigns of Edward I and Henry VII. The early boundaries of the town were defined by the limits of the abbot's manors of Hyde, Neyte, and Eye, with perhaps the practically uninhabited manor of Paddington. Hyde may be taken roughly to correspond with the

present park of that name, Neyte taking in the Chelsea area, and Eye the marshy area from Hyde Park to Tothill Street. A court of justice was established at Westminster; and this was to persist after the king had migrated from the immediate palace to palaces at Whitehall, St. James's, Kensington, and further afield.

The growth of the town followed a normal course until the ravages of the Black Death in 1348, after which an already considerable trade in wool received an unnatural stimulus to reconstruction by the appointment of Westminster in 1353 as a wool staple for ten years. By the reign of Elizabeth the line of houses from London to Westminster by way of the Strand (*q.v.*) was continuous.

Considerable alterations in the neighbourhood of abbey and palace took place in the reigns of George II and George III. The importance of Tothill Street vanished with the opening of Victoria Street in 1851, the making of which involved the demolition of a mass of dirty courts and houses. The Thames Embankment (*q.v.*) brought in some 30 acres from the river shallows, and Northumberland Avenue was opened in 1876 to connect it with Trafalgar Square. The laying out of Parliament Street in the years following 1756, with the opening of Westminster Bridge six years earlier, were other changes.

During Four Centuries

Before the dissolution of the monastery, Westminster was governed by the abbot as lord of the manor, with such modifications as were implied by the king's palace and courts of justice. In 1540 it became a city with the establishment of a bishopric which was to last only ten years. In the R.C. Church it is the seat of an archbishop. In 1544 the city and liberty of Westminster was created a borough to return two members to parliament, a source of constant rivalry between the vestries of S. Margaret and S. Martin-in-the-Fields. The precinct of S. Martin-le-Grand in London shared in the election as part of the endowment by Henry VII of his new chapel in the Abbey. From 1590 the vestry of S. Margaret became "select," receiving statutory recognition in 1663. In 1856 many of its duties were transferred to a board of works, but in 1888 the united vestries of S. Margaret and S. John were granted complete control of local matters. By the redistribution of parl. seats, 1948, Westminster

was united with the City of London in one constituency.

In 1900 Westminster attained civic government under a mayor and corporation. The creation of other boroughs cut away slices of the old domain; but Westminster still includes Hyde Park, its N. boundary being Bayswater Road and Oxford Street. German bombs in the Second Great War killed 1,100 persons and injured over 5,000, while 1,200 buildings were destroyed. Westminster may be regarded as the centre of the British Commonwealth, for here the kings have been crowned; the mother of parliaments has sat, with brief interludes, since the beginning of parliamentary government; the cenotaph in Whitehall commemorates the British dead in both Great Wars. Pop. est. 103,440. See Caxton Hall; London, and map facing p. 5255; Parliament, Houses of; S. Margaret's; Westminster Abbey; Westminster School. Consult Antiquities of Westminster, J. T. Smith, 1807-09; W.: A Historical Sketch. H. F. Westlake, 1919.

Westminster, MARQUESS AND DUKE OF. British titles held by the family of Grosvenor (*q.v.*). Sir Richard Grosvenor (1731-1802) was made Earl Grosvenor in 1784, and his son Robert, 2nd earl (1767-1845), who held political office under Pitt, was made marquess of Westminster in 1831. The 3rd marquess, Hugh Lupus Grosvenor (1825-99), was made a duke in 1874; he was a follower of Gladstone until Home Rule was introduced.

His grandson, Hugh Richard Arthur (b. March 19, 1879), became in 1899 the 2nd duke. He served with distinction during the First Great War, especially when in command of armoured cars operating against the Senussi (*q.v.*) in 1916. The duke owes his great wealth to the London property acquired in 1676 by Sir Thomas Grosvenor by marriage with the daughter of Alexander Davies. He has a town house in Davies Street, W.1, and owns Eaton Hall with about 50 sq. m. in Cheshire and Flintshire. After the Second Great War he actively interested himself in rehousing tenants of his bombed London property.



1st Duke of Westminster, British politician



Westminster Abbey. General view of the choir and nave, looking west from the chapel of S. Edward the Confessor, whose shrine is seen in the centre foreground. Beyond the 15th century stone screen is the choir

Westminster, STATUTES OF. Name given to three Acts of parliament. The earliest, in 1275, in the reign of Edward I, reaffirmed many earlier laws, confirmed charters and the rights of the Church, secured the freedom of elections, reformed legal procedure, and limited feudal aids. The second, in 1285, in the same reign, reformed abuses in connexion with the laws of dower, advowson, and manorial jurisdiction, compelled the counties to indict felons, regulated the appointment of justices and constables, provided for the better policing of towns and highways, and obliged men of each class to furnish themselves with suitable arms.

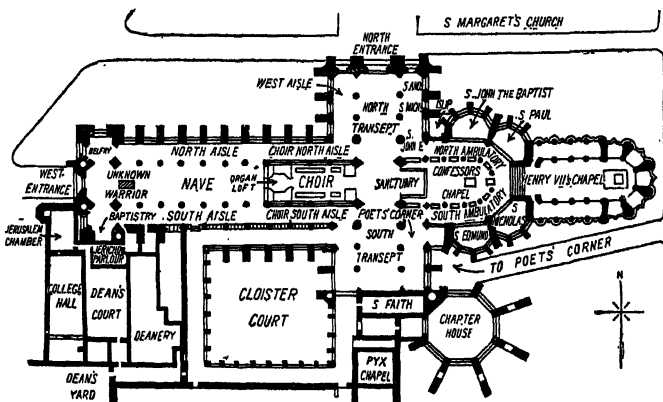
The Statute of Westminster, 1931, a result of the imperial conferences of 1926 and 1930, laid down the principle of dominion status. The imperial parliament was not to legislate for any dominion without the consent of the latter, and laws made in a dominion were to be valid even if repugnant to English law. The dominions "are autonomous communities within the British Empire, equal in status, in no way sub-

ordinate one to another in any aspect of their domestic or external affairs, though united by a common allegiance to the crown, and freely associated as members of the British commonwealth of nations."

Westminster Abbey. Officially the collegiate church of S. Peter in Westminster. Its early history, and that of the Benedictine monastery associated with it, are shrouded in legend. The first

church of which record exists stood in the 8th century to the W. of the present structure and was dedicated to S. Peter. It was rebuilt in Norman style, 1050-65, by Edward the Confessor; of this structure a few fragments exist in the Chapel of the Pyx and the Undercroft beneath the Islip chapel. Henry III added a lady chapel, rebuilt by Henry VII, and began a reconstruction that continued until the time of Wren and Hawksmoor, who repaired and raised the W. towers, 1713-40. The design of the N. transept was remodelled by Sir Gilbert Scott and J. L. Pearson in 1890. The abbey was lighted by electricity in 1913. Air-raid damage in the Second Great War amounted to £135,000; five of the abbey houses were destroyed, but no really historic feature was lost.

The church is cruciform; extreme exterior length, including Henry VII's chapel, 530 ft.; interior length of nave, 166 ft., breadth 38 ft. 7 ins., height 101 ft. 8 ins.; interior breadth of nave and aisles, 71 ft. 9 ins.; length of choir 155 ft. 9 ins., breadth 38 ft. 4 ins., height 101 ft. 2 ins.; height of lantern, 151 ft.; height of W. towers, 225 ft. 4 ins. The main entrance is at the W. end. The work of five centuries, Westminster Abbey displays several styles; apart from the Perpendicular glories of Henry VII's chapel, it is claimed as one of the best examples of E.E. architecture in existence. It has been the burial-place of many sovereigns and other illustrious dead, statesmen, warriors, writers; the scene of the coronations of kings and queens since Harold, and of innumerable royal weddings and other national ceremonies. In the chapter house the house of commons met from about 1289 to 1547. There are 11 chapels



Westminster Abbey. Ground plan showing position of the chapels and other ecclesiastical buildings



The pseudo-Gothic towers flanking the west front were completed in 1740, from designs left by Sir Christopher Wren. At the foot of the S. tower, right, is the 14th century Jerusalem Chamber, now the chapter room. In the foreground is Westminster School Crimean War memorial; in the right distance, the Victoria Tower of the Houses of Parliament

WESTMINSTER ABBEY: WEST FRONT OF ENGLAND'S NATIONAL SHRINE

in addition to Henry VII's. The E. angle of the S. transept has been known as Poets' Corner since about 1766, from the tombs and monuments of Chaucer, Spenser, Shakespeare, and other great poets. In the abbey are the tomb of the Unknown Warrior of the First Great War, and a memorial window to airmen in the battle of Britain. The cloisters and other parts of the monastic buildings date from the 13th and 14th centuries. *See* Belfry; Caxton, illus. p. 1874; Chantry; Chapter House; Coronation; Henry VII's Chapel; Jerusalem Chamber; Poets' Corner; Stall; Unknown Warrior.

Westminster Assembly. Body of lay and clerical members appointed by the Long Parliament in 1643 to decide upon the form of Church government and the doctrine to be adopted in England and Scotland. The assembly held its first session on July 1, 1643, and sat until Feb. 22, 1649. The result of the deliberations of the assembly was to supersede the Prayer Book by the Directory of Public Worship, to formulate a Presbyterian system of Church government, and to draw up the Westminster Confession of Faith.

Westminster Bank. British banking organization. In 1918 the London, County, and Westminster Bank merged with Parr's Bank, the combine holding also a controlling interest in the Ulster Bank. Next year the Nottingham and Notts Banking Co. was acquired. The name was changed in 1923. This was the first bank granted a coat of arms, 1928. Head office is at 41, Lothbury, London, E.C.2; there are over 1,000 branches.

Westminster Bridge. London bridge across the Thames from the Houses of Parliament to St. Thomas's Hospital. Replacing a stone structure of 1739-50; it was designed by T. Page and built 1856-62. Its total length is 1,160 ft.; width, 85 ft. It has seven iron arches on granite piers, the central arch being of 120 ft. span and 22 ft. above high water, and the others in pairs of 115 ft., 104½ ft., and 94½ ft. respectively. The foundations of the granite piers are 30 ft. below low-water mark. *See* Parliament.

Westminster Cathedral. Seat of the R.C. archbishop of Westminster. It stands near Victoria Street, London, a building of red brick in early Christian Byzantine style, with a domed campanile, 283 ft. in height. Designed by J. F. Bentley (1839-1902), its foundation stone was laid June 29, 1895, and it was consecrated in

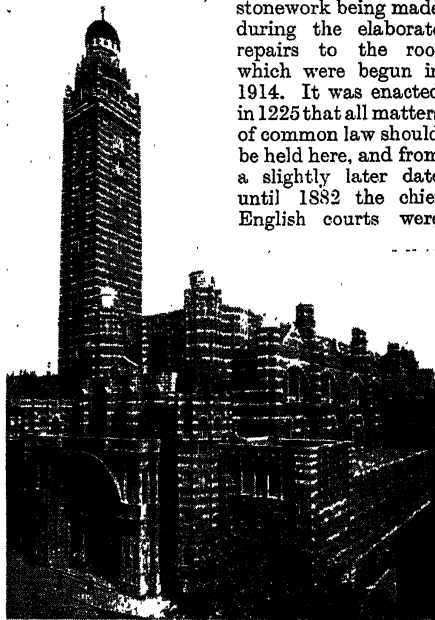
1910. The nave is 234 ft. long and 60 ft. wide, and the total area is 54,848 sq. ft. *See* Rood illus.

Westminster College. Presbyterian theological college. Originally established in Queen Square, London, to train students for the ministry of the Presbyterian Church of England, it was removed in 1899 to its present site between Pound Hill and Northampton Street, Cambridge. It was erected at a cost of £46,000, the chief contributors being Mrs. Agnes Lewis and Mrs. M. D. Gibson (*q.v.*).

Westminster Gazette. Former London newspaper, amalgamated in 1928 with The Daily News. Founded as an evening Liberal organ by Sir G. Newnes, in 1893, it was edited first by Sir Edward Cook (*q.v.*), who was succeeded in 1896 by J. A. Spender (*q.v.*). Under the managing directorship of Sir C. Starmer the paper appeared as a morning journal from 1921. *See* News Chronicle.

Westminster Hall. Historic London building, the most notable remaining part of the old palace of Westminster. The original structure was completed in 1097 for

William Rufus. During 1394-99 Richard II raised the walls, provided the oaken hammer-beam roof, and added the N. porch and towers. Many later repairs and alterations followed, notable discoveries of Norman stonework being made during the elaborate repairs to the roof which were begun in 1914. It was enacted in 1225 that all matters of common law should be held here, and from a slightly later date until 1882 the chief English courts were



Westminster Cathedral. West front and campanile of the principal Roman Catholic church in England

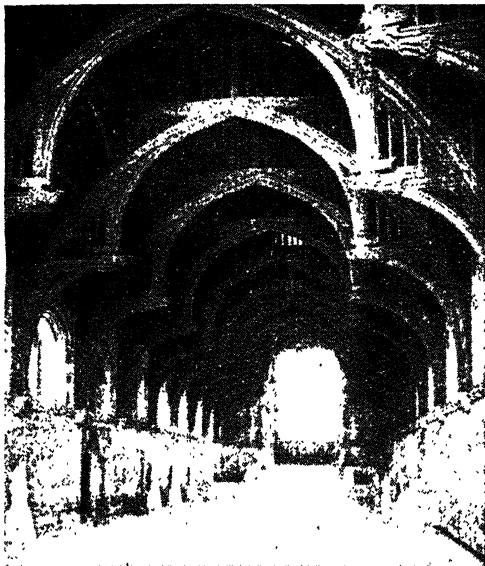
held, first in the hall, and then in new buildings erected on the W. side.

Here Richard II was deposed, Charles I condemned, Oliver Cromwell installed as lord protector; here,

among others, Wallace, More, Anne Boleyn, Strafford, the Seven Bishops, and Warren Hastings stood their trial. The hall, which is 290 ft. long, 68 ft. wide, and 92 ft. high, was in the 17th century partly occupied by booksellers, law stationers, and other tradesmen; it was the scene, until the time of George IV, of the coronation banquets. The bodies of Gladstone, Edward VII, George V, and victims of the disaster to the airship R101 lay here in state. Here a joint assembly of lords and commons offered to George V addresses on his silver jubilee. Parliament was addressed here in the



Westminster Bridge, London. View of the bridge, showing the Houses of Parliament, and the clock tower housing Big Ben



Westminster Hall, London. Interior of the ancient hall, showing the magnificent hammer-beam roof

Second Great War by Gen. Smuts. South of the members' entrance on the E. side entry is gained to the cloisters and to S. Stephen's Crypt.

Westminster Hospital. Medical institution in Westminster, London. Established as a charity in 1719, it was moved to another site, adjoining the Middlesex Guildhall, in 1834, and was enlarged in 1900-01. In 1939 it was rebuilt on yet another site in S. John's Gardens, Horseferry Road. It has 421 beds, and training schools for nurses, radiographers, and physiotherapists.

Westminster School. English public school. Originating in a school attached to Westminster abbey, whence its name of S. Peter's College, Westminster, it was refounded first by Henry VIII, and then in 1560 by Elizabeth. The school is built around Little Dean's



Westminster School arms

Yard. The scholars of Elizabeth's day were accommodated in the old granary of the abbey, and their dining hall, or college hall, was the refectory of the abbot. The great school room was once the monks' dormitory. Boys who gain scholarships on the Elizabethan foundation are known as king's scholars. Most of them live in college, but a few are day boys. There are about 300 boys not on the foundation.

and Southey. The school was badly damaged by German bombs in 1941. Consult Annals of Westminster School, J. Sargeant, 1898; Record of Old Westminsters, G. H. R. Barker and A. H. Stenning, 1928.

Westminster Theatre. London playhouse, in Palace Street, S.W.1. It was opened Oct. 7, 1931, under the management of Amner Hall, the first production being James Bridie's *The Anatomist* (revived



Westminster School. Corner of the quadrangle with chapel entrance and five courts

at the same theatre, 1948). Other plays included *The Lake*, 1933; *The Dog Beneath the Skin*, 1935; *Mourning Becomes Electra*, 1937; *The Zeal of Thy House*, 1938; *It Depends What You Mean*, 1944. For a time the theatre acquired a reputation as a home of experimental work by writers of the school of W. H. Auden and C. Isherwood. The theatre, which was for a short time in the hands of the Oxford Group (*q.v.*), seats 680.

Westmorland. Northern county of England. With an area of 789 sq. m., it is inland save that it has a strip of coast at the mouth of the Kent on Morecambe Bay, and is almost wholly mountainous. The Pennine Chain enters the county in the N.E., and in the E. is a hilly moorland district, where are several heights over 2,000 ft., among them Milburn Forest, Dufton Fell, and Wild Boar Fell. The W. portion of the county forms part of the Lake District (*q.v.*), Helvellyn (3,118 ft.) being the highest point. The chief rivers are the Eden, Lowther, Kent, and Lune, and the lakes include Grasmere, Hawes Water, Rydal Water, and parts of Ullswater and Windermere. In the valleys the soil is fertile, but much of the land is suitable only for feeding sheep. Marble, graphite, lead, and slate are worked.

Appleby is the county town, Kendal and Ambleside being other places. There are castles at Brough, Appleby, and Kendal. Brougham Castle, Lowther Castle, and Levens Hall are modern residences. The only religious house of importance was the abbey at Shap. Westmorland was made a county soon after 1100. It was divided into two baronies, Appleby and Kendal, and later into wards for protection against the Scots. One M.P. is returned. Pop. 65,408. See map in following p.

LITERARY ASSOCIATIONS. Ephraim Chambers was born at Kendal, and John Langhorne, poet and translator of Plutarch, was born at Winton, Kirkby Stephen. Wordsworth lived at Grasmere and Rydal, and is buried at Grasmere; places associated with his poetry are too many to particularise. At the Nab, near Rydal, lived

Hartley Coleridge, who is also buried at Grasmere, and in the same house De Quincey lived later. At Fox How, near Rydal, resided Thomas Arnold and his gifted family. Elleray, near Ambleside, was the home of John Wilson, better known as Christopher North, and at Ambleside, Harriet Martineau lived for many years. Beatrix Potter, writer of children's tales, lived at Sawrey, where she had a farm; and local scenes figure

in her coloured pictures. See Lake District and bibliography.

Westmorland, EARL OF. English title held by the families of Neville and Fane. The first grant of the title, 1397, was to Ralph (1364-1425), 4th Baron Neville of Raby, who was prominent in the reigns of Henry IV and V, and is the character to whom Shakespeare makes Henry V address the famous "band of brothers" speech. Charles (1543-1601), 5th earl, who was involved in R.C. plots, fled to the Netherlands, where he died, having lost the earldom by attainder in 1571. In 1624 the title was granted to Sir Francis Fane. His great-grandson John (d. 1762), 7th earl, fought under Marlborough. On his death the title passed to a kinsman Thomas, whose great-grandson John (1784-1859), 11th earl, was a distinguished soldier and diplomatist. From him the title descended in 1948 to David (b. March 31, 1924), 15th earl. An eldest son of the earl bears the courtesy title of Lord Burghersh.

Weston. One of the commonest English place names. It occurs specially frequently in Somerset. The parish of Weston, on the Avon and the rly. 2 m. N.W. of Bath, was the scene of a battle in the Civil War, 1643. Weston Bampfylde lies 7 m. N.E. of Yeovil; Weston-in-Gordano is near the Severn estuary, 3 m. N.E. of Clevedon; Weston Zoyland is in the middle of Sedgemoor, and in its church lay the wounded of Monmouth's army in the battle of 1685. Weston-super-Mare has a separate entry.

Weston, DAME AGNES E. (1840-1918). A British philanthropist, known as the Sailor's Friend. She was born in London, but removed to Bath, and in 1868 began her philanthropic work by visiting hospitals. Later she started a series of monthly letters to seamen,



Agnes Weston, British philanthropist



Westmorland, England. Map of the mountainous county

popularly called Bluebacks, which attained a circulation of over half a million. Active superintendent of the Royal Naval Temperance Society, in 1876 with Miss (later Dame) Sophia Wintz she opened a Sailors' Rest at Devonport, and later at Portsmouth. Miss Weston was created G.B.E. just before she died Oct. 23, 1918. Her publications include *My Life Among the Bluejackets*, 1909, and the periodical *Ashore and Afloat*. *Consult Sparks Among the Stubble*, C. Maud, 1924.

Weston, SIR RICHARD (1591-1652). English agriculturist. The son of a Surrey knight, he was educated in Flanders, succeeding to his father's estate at Sutton, near Guildford, in 1613. He was the first to introduce the system of canal and river locks, but is best

known for his introduction of Flemish agricultural methods. His mansion, Sutton Place, was the seat of Lord Northcliffe, 1905-16.

Weston-super-Mare. Co. bor. and seaside holiday resort of Somerset,

set, facing the Bristol Channel, 15½ m. W. of Bristol, with a rly. station on a loop line. The town has grown within a century from a small fishing village to "the largest resort between Lancashire and Land's End," with a fine promenade, two pleasure piers, a large marine lake, winter gardens, etc., catering for holidaymakers from



Weston-super-Mare, Somerset. The sea front from the air

western and midland industrial centres. In the pleasant woods on a spur of the Mendips, immediately above the town and protecting it from the N., is the site of an ancient British camp. The wide expanse of estuary mud revealed at low tide is supposed to have health-giving properties; it also gives the sea a greyish-brown appearance. Weston-super-Mare gives its name to a co. constituency. Pop. est. 37,470.

West Orange. Town of New Jersey, U.S.A. It was formed from part of Orange, in Essex co., in 1862. There is rly. connexion with New York, about 12 m. to the E. In Llewellyn Park are fine mansions. Edison retired to W. Orange in 1887 to perfect the gramophone and other machines. The steel and concrete Edison plant, covering 29 acres, makes electrical devices and accessories. Another product of the town is Portland cement. Pop. 25,662.

Westphalia. Region of Germany, until 1945 a prov. of Prussia. Containing the bulk of the Ruhr industrial area, it is Germany's chief workshop. The prov. of Westphalia had an area of 7,804 sq. m. and a pop. of over five millions. Its capital was Münster, its main cities Dortmund, Gelsenkirchen, Bochum, Hagen, and Bielefeld. Situated between the Rhineland and the Netherlands on the W., Hanover on the N., and Hesse-Nassau on the E. and S., it had wooded heights—Teutoburger Wald, average 1,450 ft.; Weser Mts., average 1,050 ft.; the Sauerland, up to 1,000 ft. in the centre; with several mts. up to 2,760 ft. Of its rivers, the Weser and Ems gave access to the North Sea, the Lippe and Ruhr to the Rhine, and canals link the Ruhr valley with other waterways. There are several big dams, e.g. Möhne, with power stations, and a large network of gas and electrical supply direct from the mining district. Though agricultural as to 62 p.c. of the total area, Westphalia had most of its people engaged in industry, above all coal mining and the iron and steel industry based thereon. Textile trades, making of glass, ceramics, paper, cigars and tobacco, sausage making, ham curing, and brewing gave other employment.

The pop. is very much a type of its own, Lower Saxon, and in buildings, customs, dress, and language (*Platdeutsch*), preserves old traditions. In the Ruhr towns, however, it is mixed with many immigrants; before the Second Great War there were more than

100,000 Poles, and many others of Slav origin. About 53 p.c. were R.C., 46 p.c. Protestant, the former under an archbishop at Paderborn.

Westphalia about 700 was one of the three tribal areas of the Saxons; from the 9th century to 1180 it was part of the duchy of Saxony; then until 1807 a duchy on its own, including after 1500 some 50 smaller sovereignties, largely of the Church, and parts of what were later the Netherlands and Belgium (Utrecht, Liège). Napoleon turned it, together with Hanover, Hesse, and Brunswick, into a kingdom under his youngest brother Jerome, separating from it in 1810 N. Hanover. That kingdom was nearly twice the size of the prov. acquired by Prussia at the Vienna congress, 1815. During both Great Wars Westphalia was a main German arsenal; consequently during the Second Great War its towns were very severely bombed from the air, and in 1945 the country was the scene of desperate battles. Under British occupation after that war, it was joined with the N. half of the Rhine prov. to form the Land of N. Rhine-Westphalia (pop. 11,808,000), with capital Düsseldorf. *See* Ruhr.

Edgar Stern-Eubarth, Ph.D.

Westphalia, TREATY OF. General peace that closed the Thirty Years' War (*q.v.*), Oct. 24, 1648. Fruitless negotiations began in 1636, but formal discussions were opened in 1644 between the R.C. powers at Münster, and between the Protestant powers at Osnabrück, the war continuing meanwhile. The chief parties were the emperor, the kings of France and Sweden, and the leading German princes.

Religious toleration was formally established except in the Hapsburg territories. The lands of spiritual powers were assigned to those who occupied them on Jan. 1, 1624, or in some instances 1618. Sweden received W. Pomerania, parts of Mecklenburg, the archbishopric of Bremen, the bishopric of Verden, and representation in the diet. France was confirmed in her possession of Metz, Toul, and Verdun, and obtained the sovereignty of most of Alsace. Saxony received Lusatia. Chief gainers were Brandenburg—which obtained E. Pomerania, Cleves, Mark, Ravensberg, the bishoprics of Halberstadt, Minden, and Kammin, and ultimately Magdeburg—and Bavaria, whose elector was confirmed in his dignity and in the possession of the Upper Palatinate. The independence of Switzerland and of

the United Provinces, or Dutch Netherlands, was recognized. The old empire was transformed into a loose federation of some 300 independent states, Austria and Brandenburg-Prussia the biggest.

West Point. American military academy. It stands on the right bank of the Hudson river, in Orange co., N.Y., about 50 m. N. of the city of New York. Established in 1802, it occupies an elevated site amid picturesque river scenery, the land on which it stands covering 3,575 acres, including Constitution Island, presented to the govt. by Mrs. Russell Sage in 1908. Candidates for admission must be between 17 and 22 years old. Eight are appointed from each state on the nomination of its senators and four from each congressional district on the nomination of congressmen. Other nominations bring the total up to 2,490. The course of study lasts four years. Successful cadets may be commissioned as 2nd lieutenants in the U.S. army.

Westport. Urban dist., seaport, and market town of Mayo, Eire. Standing in Clew Bay, at the mouth of a small river, it is 10 m. S.W. of Castlebar, and has a rly. station. The chief trade is export of grain. There is some trade in provisions, and mineral waters and clothing are manufactured. Market day, Thurs. Pop. 3,238.

Westport. Seaport of South Island, New Zealand. Once the best harbour in the island, it now often becomes bar-bound. It stands at the mouth of Buller river, in Nelson dist., and is the terminus of a rly. line, 30 m. long, serving the adjacent coalfield. Pop. 4,240.

West Punjab. Territory of Pakistan. Under the partition of the Punjab in 1947, this prov. of the former British India was divided between India (E. Punjab) and Pakistan (W. Punjab). Roughly the boundary is the Ravi river at the point where it enters the Punjab from Kashmir, a little W. of Pathankot. It breaks away S. from the river in conformity with the boundary of the Lahore district towards Kasur, and joins the Sutlej opposite Ferozepore. It then follows this river, and after leaving E. Punjab, marks the border of the Muslim state of Bahawalpur till it reaches the Indus. W. Punjab includes the whole of the Rawalpindi and Multan divisions, the districts of Sialkot, Gujranwala, Sheikhupura, and parts of the Lahore and Gurdaspur districts.

West Riding. One of the three administrative divisions (O.E. *thriding*, third part) of Yorks, England. It is in many respects a co. of itself. Heavily industrialised, it is the main centre of the English woollen and steel industries. It contains most of the great manufacturing cities of Yorkshire—Leeds, Bradford, Sheffield, Huddersfield, Halifax, and Wakefield, the capital. Other towns are Barnsley, centre of a coalfield; Goole, the only port; Rotherham; Doncaster, Penistone, and Keighley. There is much beautiful scenery around Harrogate and Knaresborough, and in the river valleys, notably Wharfedale. This riding is bounded W. by Lancs and Westmorland, N. by the N. Riding, E. by the E. Riding and Lincs, S. by Notts, Derbyshire, and Cheshire. Area, 2,775 sq. m., which would make it alone the biggest English county. Pop. 3,352,555.

West Riding Regiment. Former name of the regiment of the British army now known as the Duke of Wellington's Regiment, and so described in this work.

West River. English trans. of the name of the Chinese Si-kiang (*q.v.*).

West Surrey Regiment. Regiment of the British army. Raised in 1661 as the 2nd Foot, it is the



West Surrey
Regiment badge

oldest English line regt. It was formed to garrison Tangier, which had passed into English possession as part of the dowry of Catherine of Braganza on her marriage to Charles II. In her honour it was called the Queen's Regiment; in 1881 it was given the territorial designation of West Surrey; its present title is The Queen's Royal Regiment (West Surrey).

In 1685 it took part in the suppression of Monmouth's rebellion; from its badge, the paschal Lamb, and the name of its colonel, Kirke, the regt. was nicknamed Kirke's Lambs, earning notoriety for brutal hunting out of Monmouth's supporters. In 1695 it fought at Namur and at Tongres, where gallantry earned the prefix Royal. Throughout the greater part of the 18th century, the Queen's served as marines, and for their work on the Glorious First of June received the privilege of wearing naval buttons. After service under Abercromby in Egypt, this regt. moved to the Peninsula and fought at Vimero, Salamanca, Vittoria, and Toulouse. It was in Afghanistan, 1838-39;

the Kaffir War, 1851-53; China War, 1860; Burma, 1885-86; and the Tirah operations. It helped to relieve Ladysmith and fought at Colenso.

Twenty-five battalions were raised in the First Great War and earned the battle honours: Retreat from Mons; Ypres, 1914, '17, '18; Somme, 1916, '18; Messines, 1917; Hindenburg Line; Vittorio Veneto; Gallipoli, 1915; Palestine, 1917-18; Mesopotamia, 1915-18; N.W. Frontier, 1916-17. In the Second Great War battalions served in France, 1940, N. Africa; Italy; Burma; N.W. Europe. The regimental depot is at Guildford.

West Virginia. State of the U.S.A. One of the S. Atlantic group, its area is 24,181 sq. m. It occupies part of the Allegheny Plateau (3,500 ft.), and slopes down to the Ohio river in the W.; the E. boundary is formed by the Allegheny Mts., which have various parallel ridges, extending towards the centre of the state. The Big Sandy, Guyandot, Great and Little Kanawha, and Monongahela rivers are tributary to the Ohio, which drains almost the entire region; in the N.E. the Potomac partly separates the state from Maryland.

Nearly three-quarters of the surface is forest, and lumbering ranks first among West Virginia's industries. The fertile soil yields excellent crops, and dairy farming thrives. Apples, plums, peaches, and grapes are grown, and the annual crop of tobacco is some 3,000,000 lb. An enormous coal area produces nearly 150,000,000 tons per annum, and there is also a considerable output of petroleum, natural gas, salt, and iron. West

Virginia university at Morgantown and other institutions, including the state college for negroes, offer higher education. The state has nearly 4,000 m. of rlys. Two senators and six representatives are sent to congress. Charlestown is the capital; other principal cities include Huntington, Wheeling, Clarksburg, Parkersburg, and Fairmont.

For many years after the War of Independence West Virginia was part of the state of Virginia,

although some of its inhabitants from time to time attempted to break the connexion. In 1862 the electors ratified an ordinance providing for the new state, which was admitted to the union a year later. British linguists have found a close approximation to Elizabethan speech in the less accessible parts of the state. Pop. 1,901,974. Consult W. V.: The Mountain State, C. H. Ambler, 1940.

West Wall. Name given to the series of fortifications, sometimes called the Atlantic Wall, constructed along the coasts of France, Belgium, and the Netherlands by the Germans during the Second Great War. It included revolving forts, massive concrete emplacements with camouflaged guns, storage galleries excavated in the cliffs, underground guard-rooms, underwater mines and spikes. The work of forced labourers directed by the Todt (*q.v.*) organization, the wall was believed by the Germans to be impregnable. It might have proved to be so in and near the Channel ports, where it was strongest, because the Germans anticipated attempts at landing to be made there. The wall's existence was one of the reasons for the Allied decision to land farther W. See D-day; Dieppe; Dieppe Raid.

Westward Ho! Village and seaside resort of Devon, England. Situated on Bideford Bay in the



Westward Ho! The quiet Devonshire resort, situated at the foot of Northam Burrows

urban dist. of Northam, 3 m. N. of Bideford, it takes its name from Kingsley's novel (*v.l.*). It is famous for its pebble ridge and golf links. Here from 1874 to 1904 was the United Services College, at which Rudyard Kipling was educated and of which he gives a picture in *Stalky & Co.*

Westward Ho! Romance of adventure by Kingsley, first published in April, 1855, with the title of *Westward Ho!*; or the Voyages and Adventures of Sir Amyas

Leigh, knight. Partially founded on fact, it tells of Elizabethan sea-captains and their adventures on the Spanish Main.

Westwood, JOSEPH (1884-1948). Scottish politician. Born Feb. 11, 1884, he left his Buckhaven school at 13 and was an errand boy before going into the mines. In 1918 he was chosen political organizer of Scottish miners. Entering parliament as Labour M.P. for Peebles and S. Midlothian, 1922, he lost the seat 1931, but was returned for Stirling and Falkirk 1935. Knowledgeable about health, housing, and local govt., he was under-secretary for Scotland in the coalition govt. 1940-45, becoming secretary in the Labour govt. 1945. He resigned 1947, and was killed in a road accident in Fife, July 17, 1948.

West Yorkshire Regiment. Unit of the British army. Raised in 1685 to assist in the suppression of the Monmouth rebellion, it came on to the establishment next year as the 10th Foot. It went overseas with William III and took part in all Marlborough's victories. Gallant conduct during the Jacobite rising of 1715 earned the present badge, the white horse of Hanover. The regt. was at the defence of Gibraltar in 1727, and formed part of Wade's force against Charles Edward in 1745. The 10th Foot served throughout the American War of Independence, then was at the sieges of Valenciennes and Tournai, then sent to the West Indies.

At the outbreak of the Napoleonic Wars it was drafted to Egypt, where it fought under Abercromby. Moving to the Peninsula, it was with Moore at Corunna, and served with Wellington both in Spain and at Waterloo. It gained further honours in the Crimean War and the Indian Mutiny, and served in the New Zealand War of 1861-63. For its gallantry in the Afghan War of 1879-80, the regt. was granted the title of Prince of Wales's Own. It was at the relief of Ladysmith.

Thirty-one battalions were raised in the First Great War, and earned the battle honours: Armentières, 1914; Neuve Chapelle; Somme, 1916, '18; Ypres, 1917, '18; Cambrai, 1917, '18; Villers Bretonneux; Tardenois; Piave; Suva. In the Second Great War battalions fought in

France, 1940; Eritrea; N. Africa; Burma; and Java. One was converted to an armoured regt., and another became a tank recovery unit. The regimental depot is at York.

Wetaskiwin. City of Alberta, Canada. About 150 m. N. of Calgary and 40 m. S. of Edmonton, it is the junction where the main Winnipeg-Edmonton line of the C.P.R. meets the Calgary-Edmonton rly. A judicial centre, the town lies in the heart of good mixed farming country, with some lumbering and coal mining in the vicinity, and has natural gas wells which are municipally owned. Grain elevators, flour milling, dairying, and cheese making provide employment. Pop. 2,318.

Wet Bulb. Term applied to a thermometer whose bulb is covered with a piece of muslin wetted with water. As a result of the evaporation of moisture into the atmosphere, the bulb loses heat and the temperature falls below that of an ordinary dry-bulb thermometer similarly exposed. The combination of the two instruments is called a hygrometer (*q.v.*), the extent of the wet-bulb depression relative to the dry-bulb temp. representing a measure of the humidity. Body temp. cannot be below the wet-bulb temp. Values of 100° F. have been recorded in the Red Sea region and at Sierra Leone.

Wetherby. Market town of the W. Riding of Yorks, England. It stands on the Wharfe and on the Great North Road, 3 m. S.E. of Spofforth, with a station on the rly. The chief buildings are the parish church of S. James and the town hall. Trade in agricultural produce is the principal occupation. Steeplechase meetings are held. Market days, Mon. (cattle) and Thurs. Pop. est. 3,920.

Wethered, JOYCE (b. 1901). Maiden name of Lady Heathcoat-Amory, British golfer, born Nov. 17, 1901. A member of Worpleston club, she sprang to fame in 1920 by beating the hitherto invincible Cecil Leitch in the final on her first appearance in the English women's championship, and won the finals by enormous margins in each of the next four years. She was woman champion of Great Britain in 1922-24-25-29. Joyce Wethered has been described as further ahead of rivals than any other player at any sport. She married Sir John Heathcoat-Amory in 1937. Her brother Roger (b. 1899) was an amateur golfer of international status,

who tied for the British open championship in 1921, losing on replay.

Wetter. Another spelling of the name of a Swedish lake entered as Vätter in this Encyclopedia.

Wetterhorn. Swiss Alpine mountain in the Bernese Oberland. It rises to 12,166 ft., near Grindelwald, as the Mittelhorn. The other two summits are the Rosenhorn, 12,110 ft., and Hasli Jungfrau, 12,150 ft. The earliest ascents were made in 1844 and 1845. See Grindelwald.

Wettin. Name of a German family, from which the royal family of Great Britain is descended. The name is taken from a small town on the Saale, N.W. of Halle, where about 1000 a German noble family lived and ruled the surrounding district. In 1089 one Henry was made margrave of Meissen, and a later margrave, also a member of the family, became elector of Saxony in 1423. The family split up into several branches, and until 1918 members were kings of Saxony and dukes of the four Saxon duchies. From one of them sprang Albert, the husband of Victoria and father of Edward VII. Other members of the family were Ferdinand, who in 1836 married Maria, queen of Portugal, and whose descendants sat on the Portuguese throne until the revolution of 1910; and Ferdinand, until 1918 tsar of Bulgaria. See Guelph; Windsor.

Wetzlar. Town of W. Germany, on the river Lahn, 42 m. E.N.E. of Coblenz, in the Land of Hesse. It is an important rly. junction and a centre of the optical industry, also having iron foundries and making ovens. From 1693 to 1806 it was the seat of the supreme court of the Empire, where Goethe worked as a young lawyer and wrote Werther. A remarkable cathedral with a Roman tower (12th cent.) half serves the Protestant, half the R.C. community. Other old buildings commemorate the free city of the 12th century, developed from an ancient royal castle. After a short French occupation, Wetzlar fell in 1815 to Prussia. Overrun by the U.S. 1st army at the end of March, 1945, it lay after Germany's surrender in the U.S. zone of occupation. Pop. 25,600.

Wewak. Harbour and airfield on the N. coast of British New Guinea. Occupied by the Japanese in 1942. Wewak's excellent harbour was developed by them into one of their principal supply bases in New Guinea, and



West Yorkshire Regiment badge

from early 1943 was a frequent target for Allied air raids. Australian troops advancing overland reached the coast W. of Wewak during April, 1945. On May 13 elements of the Australian 6th div. landed a few miles E. of it, took the peninsula and the airfield the same day, but secured the harbour only after heavy fighting on June 5. All Japanese remaining in New Guinea at the time of the surrender of Japan yielded at Wewak on Sept. 13. *See* New Guinea: Second Great War.

Wexford. County of Leinster, Eire. It has 90 m. of irregular and dangerous coast-line indented by Wexford Harbour, Ballyteige Bay, Bannow Bay, and Waterford Harbour. The surface is mainly a succession of low hills, but becomes mountainous in the N. and N.E. (Mt. Leinster, 2,610 ft.). The Slaney and Barrow are the chief rivers; Carnsore Pt. is the S.E. extremity of Eire. The clay soil yields oats, barley, potatoes, and turnips, while sheep, cattle, pigs, and poultry are exported to England. Deep-sea and salmon fishing thrive. The Eire state rlys. serve the county. Wexford is the county town; New Ross, Enniscorthy, and Rosslare are other places. Area, 908 sq. m. Pop. 91,704.

Wexford. Borough, seaport, and co. town of Wexford, Eire. It is situated on a hill above the estuary of the Slaney, with a harbour covering 14,000 acres, the shallowness and bar of which, however, led to the construction of a new harbour at Rosslare (*q.v.*), with which Wexford is connected by rly. The industries include herring, oyster, and salmon fisheries; shipbuilding; distilling and brewing; lime and cement works; and iron foundries.



Wexford arms

Founded in the 9th century, and a Danish settlement until 1169, Wexford was a residence of Strongbow. Cromwell laid it waste in 1649, but several of its old towers remain. Other notable features are the ruins of the 12th century Selskar abbey, or priory of SS. Peter and Paul, and ruins of S. Mary's, a priory of the Knights Hospitallers. At nearby Carrick the Anglo-Normans built their earliest castle. In 1169 a treaty was signed at Wexford between these invaders and the Gaelic nobility. Pop. 12,308. *Consult* History of Wexford, P. H. Hore, 1906.

Wey. River of Hants and Surrey, England. It rises near Alton and, entering Surrey, cuts through the hills near Guildford, and flows mainly N. until it joins the Thames near Weybridge. The chief places on its banks are Guildford and Woking. Its length is 35 m.; its main tributaries are the Tillingbourne and other Surrey streams. The Wey is also the name of a stream in Dorset which rises near Upwey and falls into the English Channel at Weymouth.

Weybridge. Part of the urban dist. of Walton and Weybridge, Surrey, England. It stands on the Wey, near its union with the Thames, and is 19 m. S.W. from London by rly. Louis Philippe was buried in the R.C. chapel of S. Carlo Borromeo, as were other members of his family. S. James, the chief church, contains a memorial by Chantrey to the duchess of York. In Portmore Park, a name which survives in that of a district, stood Ham House, given by James II to his mistress, Catherine Sedley, who married Lord Portmore. St. George's Hill, on which is a large prehistoric camp, is a tract of pine forest and heather open to the public. On it is a golf course. Weybridge has also a common. Pop. est. 8,100. Near Weybridge are Brooklands (*q.v.*) and Oatlands (*q.v.*).

Weyburn. Town of Saskatchewan, Canada. It lies 73 m. S.E. of Regina, on the C.P.R. and the C.N.R. The centre of a thriving agricultural district, it has six grain elevators, a flour mill, creameries, bottling works, and a brick and tile factory. Pop. 6,119.

Weygand, MAXIME (b. 1867). Belgian-born French soldier. Born at Brussels, Jan. 12, 1867, he was educated at St. Cyr and commissioned in the French cavalry in 1888. He had an uneventful career in the colonial army until Sept., 1914, when he was appointed chief of staff to Foch. Having fought near Ypres, in Artois, and on the Somme, early in 1917 he was French representative on the inter-Allied general staff, but rejoined Foch next year and was responsible for some brilliant staff work in critical operations.

In 1920 Weygand went to Poland to reorganize the army, which under his leadership invaded Russia and defeated the Russians. In 1922 he was appointed to the French supreme war council. High commissioner in Syria, 1923-24, he became chief of the general staff in 1930, and president of the supreme war council next

year. A biography of Turenne earned election to the Academy in 1931. Relinquishing his post as



Maxime Weygand, French soldier

c.-in-c. in 1935, he was living in retirement at the outbreak of the Second Great War.

Upon Gamelin's failure to halt the German invasion, Weygand was recalled on May 19, 1940, to the supreme command. His efforts to hold the German advance and form a defence line proved abortive, one reason being his ideological outlook; his principal concern was to conserve what remained of the army and so maintain order, rather than continue hostilities with the risk of a popular revolt. After the surrender, Weygand became minister of defence in Pétain's govt., and used his influence in N. Africa to discourage colonial resistance to Germany. He put what he sincerely considered to be French interests first, protesting to the Nazis when they infringed the terms of the armistice. As c.-in-c. and high commissioner for N. Africa, he agreed, through distrust of Great Britain, to fight in Syria when the U.K. and Free French forces took action there. In July, 1941, Weygand became gov.-gen. of Algeria, but was subordinated to Darlan, and on Nov. 20 the Germans had him dismissed. Retiring to unoccupied France, he was arrested by the Germans when they overran the country, 1942, and interned in Königstein, Saxony, later in Oranienburg prison, Tirol, until liberated by U.S. troops May 6, 1945.

By his countrymen Weygand was arrested on charges of intelligence with the enemy; sequestration of his property was ordered, July 3, but age and poor health prevented his being brought to trial. In 1948 the national assembly rejected a proposal to prosecute him for endangering the external security of the state, and quashed the sentence of infamy to which he was automatically liable as a former member of the Vichy govt. *See* France: Second Great War. *Consult* The Role of W. (conversations with his son, J. Weygand), Eng. trans. 1948. *Pron.* Vay-gon.

Weyman, STANLEY JOHN (1855-1928). British novelist. Born at Ludlow, Aug. 7. 1855, he

was educated at Shrewsbury and Christ Church, Oxford. In 1881 he became a barrister. In the novel



he achieved his first great success with *A Gentleman of France*, 1893, a vivid and attractive historical romance. This was followed by stories which attained a wide vogue. Among them were *Under the Red Robe*, 1894; *Memoirs of a Minister of France*, 1895; *The Red Cockade*, 1895; *The Castle Inn*, 1898; *Count Hannibal*, 1901; *The Abbess of Vlaye*, 1904; *Starvecrow Farm*, 1905; *The Wild Geese*, 1908. Some of his novels, e.g. *Under the Red Robe*, *Count Hannibal*, were successfully dramatised. After a long silence Weyman in 1919 published *The Great House*; and *Ovington's Bank* appeared serially in *The Cornhill* during 1921-22. Weyman died April 12, 1928.



Weymouth arms

Mun. bor. and seaside resort of Dorset, England; in full, Weymouth and Melcombe Regis. Situated on the Wey, 8 m. S. of Dorchester, it has rly. connexion with London. Its popularity as a holiday resort dates from the time of George III, who frequently resided in Gloucester House. Bathing machines were first in regular use here. The parish church of S. Mary, rebuilt in 1817, contains a fine altar-piece by Thornhill, who was M.P. for the bor. The port is a centre of coastal traffic and has regular passenger and goods service with the Channel Islands.

The earliest mention of Weymouth is in a document dated 988, and there is still in existence a charter of 1252. In 1280 Edward I settled Melcombe Regis on his queen. The Black Death first reached England here. The two places were

incorporated in 1571, when Elizabeth granted a charter of union. During the Civil War the district was the scene of much fighting and the town changed hands several times, suffering considerably in the process. From the time of Edward II until 1832 Weymouth and Melcombe Regis each returned two M.P.'s; until 1885 each had one; the town is now included in S. Dorset. It figures as Budmouth in Hardy's novels. Pop. 35,470.

Whale (*Cetacea*). Order of large mammals of fish-like form adapted to life in the oceans. The hairy coat of the terrestrial mammals and the seals has disappeared, and is represented only by a few hairs about the lips, most evident in the young. To make up for this defect in maintaining the high temp. of the blood, there is a thick layer of fat (blubber) under the smooth skin. There is no neck separating head and body, no external ears, and the nostrils (blow-holes) open on the upper surface. The fore-limbs are converted into paddles, and the hind-limbs are absent altogether, or represented by a few vestigial bones in the skeleton. The body ends behind in a large horizontal expansion of the skin and blubber that constitutes a tail fin.



Weymouth, Dorset. The Esplanade, looking east

The order is divided into two groups: the toothed whales (*Odonoceti*) and the whalebone whales (*Mystacoceti*); the former including the sperm-whale, dolphins, porpoises, and narwhal, the latter comprising right whales and rorquals. All whales breathe atmospheric air, for which they have to come to the surface at intervals. Their food is chiefly molluscs and small crustaceans.

The largest and most important of the toothed whales is the Cachalot or sperm-whale (*Physeter macrocephalus*). This creature yields the most valuable whale-oils, in addition to spermaceti and ambergris. Another toothed whale, the bottle-nosed whale (*Hyperodon rostratus*), occasionally visits British waters. The white whale (*Delphinaptera leucas*), 12 ft. to 14 ft. in length, is another gregarious species, occasionally caught off Great Britain but found chiefly off Labrador and Canada. The

skins of these two are converted into porpoise-hide.

Of the whalebone or right whales the most important formerly were the Greenland whale (*Balaena mysticetus*), and the Biscayan whale or Nordkaper (*B. glacialis*), the catching of which by the Basques is said to date from the 9th century. The Nordkaper still flourished in the 16th century, but almost died out in little more than another century; a few are still caught in the N. Atlantic. The Greenland whale is now scarcely more plentiful than the Nordkaper; but in the 17th and 18th cents.



Whale. Top, sperm whale, which yields the most valuable of the whale oils. Below, Greenland right whale, which furnishes whalebone

when its long plates of baleen or whalebone were in great demand for shaping and stiffening ladies' dresses, and the oil was used for street illumination, it existed in great numbers near the edge of the polar ice, and was overhunted. See Ambergris; Beluga; Bottle-Nosed Whale; Cachalot; Ca'ing; Cetacea; Dolphin; Fin Whale; Grampus; Harpoon; Hump-back Whale; Narwhal; Porpoise; Right Whale; Rorqual; Spermaceti. *Consult* Guide to the Whales, British Museum, 1922.

Whale, JOHN SELDON (b. 1896). British divine. Born Dec. 19, 1896, he went to Caterham school and S. Catherine's and Mansfield Colleges, Oxford. A Congregational minister in Manchester from 1925, he went back to Oxford in 1929 to teach ecclesiastical history, then in 1933 moved to Cambridge as head of Cheshunt College. In 1944 he became headmaster at Mill Hill. For the season 1942-43 he was moderator of the Free Church Federal Council. Notable in the pulpit and the press alike, he published *The Christian Answer to the Problem of Evil*, 1936; *This Christian Faith*, 1938; *Facing the Facts*, 1940.

Whale Island. Island on the E. side of Portsmouth Harbour. Thereon is the school of naval gunnery. See Portsmouth.

Whaling. The industry of catching and killing whales. It is now directed chiefly to the production of whale oil, and concentrates on the two largest species, the blue whale and the fin whale. Nearly 80 p.c. of the catch is made in the Antarctic during summer, the actual dates being fixed by international agreement. At this period whales congregate in the polar regions and feed. During their travels in milder regions they appear to eat little, if at all, and arrive in a very lean condition; so the killing season is adjusted to insure that they are in prime condition, yielding the maximum amount of oil. As a further precaution against over-killing, the minimum length (70 ft. for blue whales, 55 ft. for fin whales) and an annual quota are fixed. The killing power of a whaling fleet is so great that without precautions there would be serious danger of exterminating the species. The industry is regulated by an international whaling convention, as well as by British Acts of parliament.

The operational unit is a "factory ship" attended by up to ten catchers. A vessel of about

20,000 tons is fitted with a slipway in the stern up which the carcass can be drawn to the open deck, where the blubber is removed (flensing)—about 47 p.c. of the oil comes from blubber—and the meat and bones are cut up and boiled down to extract the oil. The liver is treated separately, its oil being specially valuable for high vitamin content. Whale oil is used in margarine, cooking fats, and soap. The meat, dehydrated, forms the basis of useful cattle foods, and selected portions are excellent for human consumption. The necessary plant for all these operations is housed in the ship. Such a ship can dispose of a 100-ton whale in less than an hour. During the 1946-47 season one vessel dealt with 2,200 whales, producing 37,000 tons of oil. The industry had not then recovered from the effect of the Second Great War, which put the whaling fleets virtually out of action; in 1937, 54,835 whales were killed and 536,000 tons of oil produced.

Though whales reach maturity in about three years, the rate of reproduction is low, probably not more than two calves in three years. Inspection, statistics, and research work, chiefly by the British Discovery expeditions in the Antarctic, and by the Norwegians in the Arctic, indicate that the rate of killing is still too high for the maintenance of stock. Even the rest period enforced by war did not appear to have completely restored the numbers of blue whales. F. Bullen's *Voyage of the Cachalot*, and H. Melville's *Moby Dick*, though fictional in form, give vivid and authentic accounts of whaling in the 1880s. *Consult also* Whales and Modern Whaling, J. T. Jenkins, new ed. 1945.

Whalley, EDWARD. An English regicide. Cousin to Oliver Cromwell, he entered the parliamentary army and was promoted major in Cromwell's horse, 1643, fighting at Marston Moor, Naseby, and Oxford. Prominent in all the great events of the Rebellion, he was in charge of Charles I at Hampton Court, was a member of the commission which tried him, and signed the death warrant. Distinguishing himself at Dunbar and Worcester, Whalley was one of Cromwell's major-generals and a member of the new house of lords. After the Restoration, a price being placed on his head, he fled to America.

Whampoa. Seaport of China, in Kwangtung prov. Situated on the island of Whampoa in the

estuary of the Si-kiang, it is the outport of Canton, where large vessels discharge cargo.

Whangee Cane (*Phyllostachys nigra*). Bamboo-like perennial of the family Gramineae. It is a native of China and Japan. Its slender, almost solid culms may be from 4 to 25 ft. long, and are exported for making into walking canes, chairs, etc.

Wharfe. River of the West Riding of Yorks, England. Rising on the S.E. slopes of Carnfell, 7 m. S. of Hawes, it flows through Langstrothdale and Wharfedale, past Grassington, Linton, Bolton Abbey, and Addingham to Ilkley. It bends E. to Otley, Harewood, and Wetherby, and then flows S.E. to Cawood, where it joins the Ouse. Its total length is 60 m. Wharfedale, both upper and lower, is considered one of the most beautiful of all Yorkshire dales, notable spots being Kinsey Crag and the Strid, Bolton Woods, where the river flows with great force between rocks only a few feet apart. From Ilkley as far as Wetherby the dale is dominated to the N. by Almscliff crag.

Wharnccliffe, EARL OF. British title borne by the family of Montagu-Stuart-Wortley-Mackenzie. James Stuart, a younger son of the 3rd earl of Bute, inherited from his mother the barony of Mountstuart and the valuable estates of the Wortley family in Yorks. His son, James Archibald Stuart-Wortley (1776-1845), was an M.P., 1798-1826; at first a strong Tory, he turned round to support the Reform Bill of 1832, and became one of the chief followers of Peel. In 1826 he was made Baron Wharnccliffe of Wortley, and he was lord privy seal in 1834, and lord president of the council, 1841-45. He died Dec. 19, 1845. His grandson Edward, 3rd baron (1827-99), was made an earl in 1876. Chairman of the Manchester, Sheffield, and Lincolnshire rly., he gave his name to the former Wharnccliffe Rooms, Marylebone. In 1926 the title came to Archibald (b. April 17, 1892), 3rd earl. An eldest son is called Viscount Carlton, and the seat is Wortley Hall, Sheffield.

Wharton, BARON. English title held by the family of Wharton from 1543 to 1731. The first holder



1st Baron Wharnccliffe, British politician
After H. P. Briggs



Philip, 1st Duke of Wharton

was Thomas Wharton (d. 1568), a Westmorland squire who served the Tudors on the Scottish borders. His descendant, Philip, 4th baron (1613-96), was the father of the marquess of Wharton (v.i.). The marquess was succeeded by his son Philip (1698-1731), one of the most dissolute men of his time. In 1718 he was made duke of Wharton, but, having squandered his fortune, travelled abroad. Attaching himself to the exiled Stuarts, he joined the Spaniards in the siege of Gibraltar, 1727, and by the house of lords was declared a traitor and an outlaw. He died May 31, 1731, when his titles became extinct. In 1916 the barony was called out of abeyance for Charles Kemeys-Tynte (1876-1934), who was succeeded by his son, Charles (b. Jan. 12, 1908).

Wharton, THOMAS WHARTON, 1st MARQUESS OF (1648-1715). English statesman. Son of the

4th Baron Wharton, a strict Puritan, he was born at Woburn, and joined the court of Charles II. A staunch Whig, he entered the house of commons in 1673,

and opposed the policy of James II. He boasted that the song Lilliburlero (q.v.), which he wrote in 1687, had "sung a king out of three kingdoms." Joining William III at Exeter, he proved one of his sturdiest political henchmen. Wharton succeeded to the peerage in 1696, was created an earl in 1706, and made lord-lieutenant of Ireland in 1708. His two years' administration occasioned Swift's Short Character of the Earl of Wharton, a fierce satire. Ardent advocacy of the Protestant succession recommended him to George I, upon whose accession in 1714 he became lord privy seal and marquess of Wharton and Malmesbury. He died April 12, 1715.

Wharton, EDITH NEWBOLD JONES (1862-1937). An American novelist. Daughter of G. F. Jones, she was born in New York, and married Edward Wharton in 1885. Her first important work was The Greater Inclination, 1899, and she

produced many novels and short stories, all admirably written and characterised by a rare feeling for intricacies of motive, character, and emotion. They gained her membership of the American Academy. Titles include

Crucial Instances, 1901; The Valley of Decision, 1902; The House of Mirth, 1905; Madame de Treymes, 1907; Ethan Frome, 1911; The Custom of the Country, 1913; Xingu, 1916; The Marne, 1918; The Age of Innocence, 1920; Twilight Sleep, 1927; Hudson River Bracketed, 1929. Reminiscences, A Backward Glance, came out in 1934. Edith Wharton died Aug. 11, 1937, at her home near Paris. Consult Portrait of E.W., P. Lubbock, 1947.

Whateley, DAME LESLIE VIOLET LUCY EVELYN MARY. Chief controller of the A.T.S., 1943-46. After a convent education at St. Leonards and Cavendish Square, London, she went into private secretarial work, then took up social welfare. In 1939 she married Sqn.-Ldr. H. R. Whateley. She succeeded Jean Knox (Lady Swaythling) as head of the A.T.S. The D.B.E. was conferred in 1946, as was the American Order of Merit. See Auxiliary Territorial Service illus., p. 810.

Whately, RICHARD (1787-1863). British divine. Born in London, Feb. 1, 1787, he was educated at Oriel College, Oxford, of which he became a fellow, and in 1814 was ordained. In 1825, after two years as a vicar in Suffolk, he was made principal of St. Alban Hall, Oxford, and in 1829 professor of political economy. Archbishop of Dublin, 1831, he there remained until his death, Oct. 8, 1863.

Whately's first publication was Historic Doubts Relative to Napoleon Bonaparte, a logical joke intended as a burlesque of German methods. His fame rests upon his Manual of Logic, which, although violently attacked in The Edinburgh Review, marks a distinct advance in the treatment of the subject. He exerted himself to

reconcile Ireland to English government, and to heal the breach between Protestant and Catholic. Consult Life and Correspondence, E. J. Whately, 1866.

What Every Woman Knows. Comedy by Barrie. It was produced Sept. 3, 1908, at the Duke of York's Theatre, London, where it had a run of 384 performances. Gerald du Maurier, Lillah McCarthy, and Hilda Trevelyan played the principal parts. The story deals with the marriage of a young man who reaches success in a political career without knowing how much he owes to his wife.

Wheat. Cereal crop, forming the principal food of mankind, especially Europeans and peoples of European origin. It is a grass belonging to the family Gramineae and the genus *Triticum*. Its origin is unknown. Excavations in lake dwellings show that the Swiss of Neolithic times cultivated at least four distinct varieties. In China wheat was grown 3,000 years before the Christian era; while it was also a principal crop in ancient Egypt.

The wheat plant normally consists of several stems or stalks each bearing roots, two rows of leaf blades, and an ear or spike at the tip; from each spike flowers and, later, kernels are formed. While growing on the plant the kernels or grains are enclosed in scale-like coverings called glumes or chaff. The wheat kernel consists of three principal parts, the coatings, the embryo, and the starchy interior or endosperm. The last, which is the part from which flour is milled, is about 76 p.c. of the whole weight of the grain. The coatings which, when ground, form the bran and pollards of commerce are about 10 p.c. of the weight. The moisture content varies greatly, but should not be above 15 p.c. of well harvested grain.

Wheat grows to a height of 2 to 5 ft., according to variety, climatic conditions, etc., and its roots may penetrate the soil to a depth of 7 ft. or more. Each seed gives rise to a single shoot, but this may be increased by tillering. Wheat is normally grown closely in rows, but when planted at wider intervals of a foot or more tillering may give rise to 50 or more ears.

More than a thousand varieties of wheat are known throughout the world, and the number increases through the activities of plant breeders and seed growers. The principal varieties in cultiva-



Thomas Wharton



Thomas, 1st Marquess of Wharton



Richard Whately, British divine After C. Grey

tion are: (1) small spelt, a single-grained wheat (*Triticum monococcum*); (2) emmer (*T. dicoccum*), which has a small, hard, reddish grain and is grown on the dry lands of the U.S.S.R.; (3) common spelt (*T. spelta*), with lax ears and chaff-covered grain; (4) macaroni (*T. durum*), bearded varieties with long narrow grain of flinty texture; (5) rivet wheat (*T. turgidum*), usually bearded, with grain which is large and plump and bears a hump on the

Working about the same time on the same plan, Col. Hallett, another experimenter, produced Hallett's red wheat. He selected those ears which produced most grain and by intensive selection increased the yield.

By cross-fertilisation a stock of wheat can be bred which combines the best characteristics of its various parent stocks. The amazing improvement in wheats is due to scientific plant breeders, such as Gartons of Warrington.

Garton Brothers began their experiments about 1890, and since then they and others—notably Biffen and Engledow of Cambridge and Percival of Reading—have bred new varieties which show very great improvement in such characters as yielding capacity,

purposes on any variety of English wheat known at that time. Yeoman has a light red grain and a very stiff straw so that it stands well even under heavy storms. In 1935 Holdfast, a white grain wheat, was introduced by Engledow as a cross between Yeoman and White Fife. For milling and bread-making purposes good samples of Holdfast equal the highest quality wheats grown in Canada and elsewhere.

Millers class wheats as "strong" or "weak." A strong wheat gives a flour capable of producing larger and more shapely loaves than that derived from a weak wheat. As a rule, the wheats sown in the spring under conditions of high sunshine produce the stronger flour. Thus, Canadian wheats are stronger than most of the autumn-sown varieties of British wheat.

Diseases of Wheat

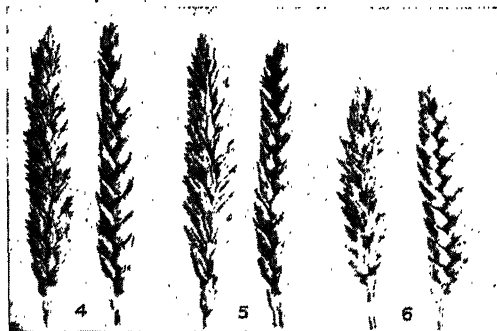
The principal diseases from which wheat suffers are bunt or stinking smut, loose or summer smut, and yellow rust. The

attacks of bunt or stinking smut fungus can be reduced and almost nullified by dusting grain before sowing with an organic compound of mercury. Loose smut and rust are uncontrollable except by the use of varieties bred to resist them. Application of an excess of nitrate of soda or of sulphate of ammonia appears to increase damage by rust.

back; (6) club wheat (*T. compactum*), a variety with short stiff straw which usually remains erect when ripe, and does not easily shed its grain: it is particularly suited to warm dry climates; (7) common wheat (*T. vulgare*), which comprises the vast majority of wheats grown for bread-making, and may be subdivided into soft, medium, and hard wheats, according to their milling qualities, or into red and white wheats according to the colour of the grain.

The geographical range of wheat is very wide: for instance, wheats such as Omega have reached maturity in areas less than 200 m. S. of the Arctic Circle. At the other extreme, wheat thrives in S. Brazil, Cuba, in many parts of the Indian sub-continent, and in Rhodesia.

Up to the end of the 18th century the wheat grown in the U.K. did not differ greatly from some of the types raised in ancient Egypt, 4,000 years earlier. The first great improvement was due to a Scottish farmer, Patrick Shirreff, who in 1819 noticed a wheat plant in one of his fields which branched in an uncommon fashion. He marked it and found that it had produced 63 ears holding 2,500 kernels. Saving the seed, he sowed it and multiplied it under fertile soil conditions, and introduced it as the new variety, Munegoswells.



Wheat. Inflorescence and grain of red-chaffed varieties: 1. Fylgia. 2. Little Joss. 3. Steadfast. White-chaffed varieties: 4. Holdfast. 5. Yeoman. 6. Juliana

From Description of Recommended Varieties of Wheat & Barley, F. Earnshaw, M.A., Ph.D. (N.I.A.B.)

stiffness of straw, resistance to disease, and milling quality of grain. To Biffen the world owes the famous Little Joss wheat, the result of a cross between Squareheads Master and Ghirka. This variety was bred principally to resist yellow rust. The yield of Little Joss on land of moderate fertility greatly exceeds that of older varieties. It has inherited the yielding capacity of Squareheads Master together with the disease-resisting properties of its other parent, Ghirka.

In 1916 Yeoman, a cross between Red Fife and Cambridge Browick, was pronounced by the association of British millers to be an improvement for milling

The average yield per acre of wheat in Great Britain rose from 24 bushels per acre in 1771 to about 32 bushels per acre in 1905; from 1938 to 1946 it averaged over 34 bushels per acre. The acreage, 3,688,357 acres in 1869, fell to 1,246,721 in 1931, rose in 1943 to 3,450,528, falling again after the Second Great War. In India and Australia the yield does not exceed 12 bushels to the acre.

The amount of wheat grown throughout the world in 1948 (excluding Russian territories and China) was estimated at 3,850 million bushels (nearly 110 million tons), compared with a total yield of 4,088 million bushels in 1913. About 44 p.c. was grown

in N. America, and 36 p.c. in W. and S. Europe; the other chief producers were India, Argentina, and Australia. During 1948 the U.S.A. proposed to export at least 450 million bushels, and Canada 240 million bushels. When Europe is in normal agricultural condition she produces more wheat than N. America. Before 1939 the U.K. imported annually about $5\frac{1}{2}$ million tons of wheat grains and flour, which was three-quarters of the amount consumed. In war the quantity imported ranged from 6.38 million tons in 1940 to 3.59 million tons in 1944; home production varying from 1.6 million tons in 1940 to 3.45 million tons in 1943. It was planned to produce 2.5 million tons in 1949. See Agriculture; Bread; Crops; Plants, colour plate; Rust Fungi; Smut.

Wheatear (*Oenanthe oenanthe*). British migratory bird. It arrives about the beginning of March. It is six inches long, and has grey plumage on the upper parts, black on the wings, black and white on the tail, and white on the breast and under parts. In the autumn the plumage assumes a reddish-brown hue. The wheatear is distributed over the whole of Great Britain, especially on waste land. It feeds chiefly on insects.



Wheatear, an early migrant to Great Britain

W. S. Berridge, F.Z.S.

Wheatley, DENNIS YATES (b. 1897). British writer of thrillers. He was born Jan. 8, 1897, and after education in H.M.S. Worcester and in Germany, helped in his father's wine business; this he owned 1926-31, then sold it to start writing. Beginning with *The Forbidden Territory*, he poured out tales and short stories of murder, espionage, and adventure in tropic seas; familiar titles were *The Devil*



Dennis Wheatley, British writer

Rides Out; *The Ssacore* (with J. G. Links); *Faked Passports*; *Gunmen, Gallants, and Ghosts*. Wheatley also wrote studies of Charles II (Old Rowley), 1933; Marshal Voroshilov (Red Eagle), 1937; *The Shadow of Tyburn Tree*, 1948. During the Second Great War he worked for

the war cabinet and rose to wing commander. He invented the games *Invasion* and *Blockade*.

Wheatley, FRANCIS (1747-1801). British artist. Born in London, son of a master-tailor, he first exhibited at the R.A. in 1778, was elected associate 1790, and R.A. 1791. He died June 28, 1801. Wheatley is best known for his popular series *The Cries of London*, though he also executed portraits and landscapes. See London, Cries of.



Francis Wheatley, British artist
Self-portrait

Wheatley, HENRY BENJAMIN (1838-1917). British antiquary, born at Chelsea, May 2, 1838. He made a special study of London topography and of the life and work of Pepys. His chief books include an edition of Pepys's Diary, 1894-99, the fullest so far published; *Samuel Pepys and the World He Lived In*, 1880; *Pepysiana*, 1899; *London Past and Present*, 1891, a revision with additions of the work of Allan Cunningham; *The Story of London*, 1904; *Hogarth's London*, 1909. Wheatley edited *Jonson's Every Man in His Humour*, 1877, and *Shakespeare's Merry Wives of Windsor*, 1886. He died Apr. 30, 1917.

Wheatley, JOHN (1869-1930). British politician. Of Irish birth, he attended village schools in Lankashire, and from 12 to 22 was working in coal mines. In the publishing business at Glasgow, he became prominent on the city corporation as leader of the Labour group. President of the Scottish Labour housing association, he was elected M.P. for Shettleston in 1922, holding the seat until his death on May 12, 1930. Wheatley was minister of Health in MacDonald's administration of 1924, but his violent criticism of a policy he believed too moderate led to his exclusion from the second Labour cabinet. Another John Wheatley (b. Jan. 17, 1908), appointed lord advocate for Scotland in 1947, was his nephew.



John Wheatley, British politician

Wheatstone, SIR CHARLES (1802-75). British electrician and

inventor. Born at Gloucester, he became a musical instrument maker in London, inventing the concertina (*q.v.*), and early took an interest in science, contributing important papers on light and optics to the *Transactions of the Royal Society*. Professor of experimental physics at King's College, London, 1834, his paper on the *Prismatic Analysis of Electric Light* was read to the British Association in 1835. He carried out experiments on the transmission of electric signals over wires, developing with Cooke the type-printing telegraph, magneto-electric dial telegraph, and automatic transmitting and receiving instruments. Wheatstone invented the rheostat, the stereoscope, synchronised electrical clocks, and perfected the *Wheatstone Bridge* (*v.i.*), 1847, based on an invention made in 1835 by S. H. Christie. He was knighted in 1868, and died in Paris Oct. 19, 1875. His Scientific Papers were collected, 1879. See *Telegraph*.

Wheatstone Bridge. Device for measuring electrical resistances in terms of one known variable resistance and the ratio of two others. The diagram shows a particular form of network used in the "post office box." This comprises two resistances, R_1 and R_2 , made up of coils which can be short-circuited by brass plugs so as to vary their ratio, usually in terms of ten, i.e. $\frac{1}{10}$, 1, 10, etc.; and a third variable resistance R_3 . X is the unknown resistance to be measured, G is a galvanometer, B a battery, and K_1 and K_2 are two contact keys for "making" various parts of the electrical circuit.

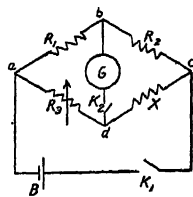
A suitable value for R_1/R_2 having been ascertained, R_3 is varied until on pressing keys K_1 and K_2 , in that order, no deflection of the galvanometer is obtained. It may be shown that for this condition of balance:

$$X = (R_2/R_1)R_3$$

In the metre bridge the arms ab , bc , are replaced by a single



Sir C. Wheatstone, British inventor



Wheatstone Bridge. Diagram of the device. See text

wire stretched on a board, usually one metre long and the position of the junction *b* may be varied by the movement of a suitable contact along the wire. Assuming the latter to be uniform, the ratio R_0/R_1 will now be given by the ratio of the length *bc* to *ab*.

Wheel. Disk or circular framework capable of rotating on an axle. The road wheel of a vehicle is a development of the roller placed under a heavy stone or similar load to lessen friction when the load is dragged. Early wheels, and some still used in undeveloped countries, are solid wooden disks of usually small diam. Later the framed wheel came into use, with the outer rim held to the hub by spokes, the whole being strongly mortised and tenoned together. The work of the wheelwright called for a high degree of skill and science, in fashioning such different types as the wheel for the heavy dray, and the extremely light but strong one for the gentleman's carriage after roads had been made firm and smooth by Telford and Macadam. For some time after motor vehicles made their appearance, coach builders continued to make old-type wheels, but gradually the wire or disk wheel came into vogue, of much smaller diam. than carriage wheels, and made of metal.

In machinery the wheel for large mechanisms was commonly made of wood; the outer rim was built up on a radiating framework which took the place of the spokes of the wagon wheel, since the radial thrust was less. Into the usually double rim were fixed separate cogs, also wooden. Smaller wheels, as used in turret clocks and winches, were generally cast in one piece, with the teeth moulded in. When large wheels were made in cast iron, it was common for the cogs still to be inserted separately; the 15-ft. flywheel of Boulton and Watt's engine of 1788 had the teeth inserted into mortises in the rim, the wheel, besides serving as a storer of momentum, transmitting motion to machinery. In Trevithick's high-pressure engine of 1811, the flywheel, 10 ft. in diam., had a grooved rim for a driving rope. See Bicycle; Flywheel; Gear; Tire; Wheel and Axle.

Wheel, BREAKING ON THE. Old form of capital punishment. The victim was tied spread-eagled either to a wheel or to a cross, and his limbs were successively broken by blows from an iron bar. He was either left to die after the punishment, or, more mercifully, was

given the *coup de grâce* by a blow on the stomach or chest. The punishment was prevalent in medieval Europe, but was abolished in most countries by the beginning of the 19th century.

Wheel and Axle. One of the mechanical powers, a modification of the lever. It consists of a cylindrical axis, to which is fixed a wheel with a grooved rim. A rope passes round the axle, and another round the rim of the wheel. The former is attached to the weight being raised, and the second rope is used for transmitting the power. The relation between *P*, the power, and *W*, the weight, is given by the equation $P \times R = W \times r$, where *R* and *r* are the radii of the wheel and axle respectively. The capstan and windlass are common examples of practical use.

Wheeler, BURTON KENDALL (b. 1882). American politician. Born at Hudson, Mass., Feb. 27, 1882, he passed through the university of Michigan law school, and became an attorney in 1906. A Democrat, he was a member of the Montana house of representatives 1911-13, and district attorney for the state 1913-18. Elected to the U.S. senate in 1922, he was chosen for three more terms, and ran for the vice-presidency in 1924. An isolationist, he toured many states in 1940-41 to attack Roosevelt's foreign policy, but changed his attitude after the Japanese attack on Pearl Harbour, to advocate war against the aggressor.

Wheeler, CHARLES THOMAS (b. 1892). British sculptor. Born at Wolverhampton, March 14, 1892, he studied at S. Kensington and first exhibited at Burlington House in 1914. His principal works were on a large scale, e.g. memorials of the First Great War at

Neuve Chapelle (Indian), and in the cloisters at Winchester College; and decorative reliefs and figures on the Bank of England, India House, S. Africa House, Church House, and other public buildings in London. His bust of the infant Christ was purchased for the nation in 1924. Wheeler became A.R.A. in 1934, R.A. in 1940, and in 1944 president of the Royal Society of British Sculptors. See Sculpture.

Wheeler, JOSEPH (1836-1906). American soldier. Born at Augusta, Ga., he was educated at West

Point, and entered the cavalry. On the outbreak of the Civil War he joined the Confederates and fought through the whole of the war, being present at Shiloh, Chattanooga, Chickamauga, and other battles. In the closing stages he led the cavalry division of Johnston's army. Later he spent many years as a lawyer and a cotton planter, but in the Spanish-American War of 1898 he held a command in Cuba, and in 1899-1900 he was given one in the Philippines. He died Jan. 25, 1906.

Wheeler, SCHUYLER SKAATS (1860-1923). American electrical engineer. Born in New York, May 17, 1860, and educated at Columbia, he became an assistant to Edison, 1883, and in 1889 was president of a company manufacturing electrical equipment. Wheeler invented the electric fan, developed the application of electricity for driving tools, and devised improvements in electric motors. He was president of the American Institute of Electrical Engineers, 1905-06. He died April 20, 1923.

Wheeler, WILLIAM ALMON (1819-87). American statesman, born at Malone, Franklin co., N.Y., June 30, 1819. He was called to the bar in 1845, and during 1861-63 and 1869-77 was Republican member of congress. He is known as the author of the Wheeler compromise for settling political disputes in Louisiana. Vice-president of the U.S.A., 1877-81, he died at Malone, Jan. 4, 1887.

Wheeling. City of West Virginia, U.S.A., the co. seat of Ohio co. Third largest city of the state, it stands on the Ohio river, 65 m. S.W. of Pittsburgh, and is served by the Baltimore and Ohio and other rlys. The first town established on the Ohio, Wheeling was settled in 1769, incorporated in 1806, and became a city in 1836. It was the capital of the state during 1863-70 and 1875-85. A large transit trade was interrupted in 1936 when the river rose 20 ft. above flood level, submerging buildings. Steel, glass, textile, and clay products are manufactured, as is tobacco. S. Joseph's R.C. cathedral is a massive and richly decorated Romanesque building. Pop. 61,099.

Wheel Lock. Mechanical device for firing early forms of guns without a slow match. One of the earliest attempts at a mechanical action of this nature is found in the Monk's gun, a steel file being arranged so that it can be pulled under a piece of flint held in a



Charles Wheeler,
British sculptor

strong spring near the flash pan, the resulting sparks igniting the priming. The wheel lock proper was invented at Nuremberg in 1515. The cock is pivoted forward of the lock, and the jaws, which point towards the butt, hold a piece of pyrites, a spring tending to force the latter on to the base of the flash pan, through the bottom of which projects the serrated edge of a steel disk. The latter is connected by a short link of chain to a drum containing a spring, which can be wound up with a key like a clock. When fully wound, a stud on the trigger drops into a hole in the drum, locking the mechanism. The wheel lock made it possible for a steady aim to be taken, an impossibility with the older guns, and the weapons were made lighter, while it was a marked improvement to be able to carry a firearm ready for use without a burning match. *See Matchlock.*

Wheelwrights' Company. A London city livery company. Dating from the 17th cent., it was granted a charter by Charles II in 1670, and in recent years has cooperated with the Carpenters' Company (*q.v.*) in promoting technical education in the craft. The office until the Second Great War was situated at the Guildhall, E.C.2.

Whelk (*Buccinum undatum*). Large marine snail. It has a thick, stony shell of a few swollen whorls



Whelk. Edible sea snail showing whorled shell

with curved, broad ribs crossed by spiral lines of growth. The animal has a broad, muscular foot, with a horny operculum behind for closing the shell. The head bears a pair of pointed tentacles with eyes at their base, and the extensible muzzle is furnished with a lingual ribbon capable of boring holes through the hard shells of other molluscs. A fold of the mantle forms a long respiratory tube for which a special channel in the shell is provided. The whelk is carnivorous. There is a regular fishery, as whelks are useful for bait and for food. They are taken by the dredge, or by sinking

baskets containing carrion and weighted by stones. The eggs of the whelk are contained in little parchment-like capsules, a large number of the latter being united into a cluster and attached to rocks or shells. *See Mollusca.*

Whernside. Mountain of Yorkshire, England. One of the highest peaks of the Pennine range, it rises 2,414 ft. just where Yorks, Lancs, and Westmorland meet. Great Whernside (2,310 ft.) and Little Whernside are other Pennine mts., at the head of Nidderdale.

Wherry. Rowing boat with stem and stern the same shape, used by watermen for carrying passengers. The Norfolk wherry, formerly met with upon the Broads, was a fast sailing barge now obsolescent.

Whetstone. Residential dist. of Middlesex, England, on the Herts border. Once a hamlet of Friern Barnet, it has a tube rly. station, Totteridge and Whetstone, and bus and trolley bus connexions with N. and Cent. London. Another Whetstone is in Leics, 93 m. N.W. of London, with a rly. station.

Whewell, WILLIAM (1794-1866). British scholar. Born at Lancaster, May 24, 1794, the son of a carpenter, he was educated there and at Heversham, before going to Trinity College, Cambridge. Second wrangler in 1816, he became fellow and tutor of Trinity. During 1828-32 he was professor of mineralogy, and during 1838-55 of moral philosophy, while from 1841 he was master of Trinity. He died March 6, 1866.



W. Whewell, British scholar

Many stories are told of Whewell's intellect and learning. Of him Sydney Smith said "Science was his forte, omniscience his foible." Whewell's mathematical textbooks have been superseded, and his History of the Inductive Sciences is out of date, but they revealed his genius. Elements of Morality, 1845, classified human rights and virtues. During his tenure of the mastership he did much to revive the standard of education at Cambridge, and owing to his efforts the moral and natural sciences triposes were instituted. In philosophy he was influenced by Kant; his ethical standpoint was intuitionist. There are lives by I. Todhunter, 1876; and by Mrs. Stair Douglas, 1881. *Pron. Hewel.*

Whey (A.-S. *hwæg*). Pale yellow fluid, the residue of milk when the curd has been precipitated by rennet. Lactose, or milk sugar, is obtained from whey by evaporation. *See Cheese.*

Whickham. Urban dist. and town of Durham, England. It is situated 3 m. W.S.W. of Gateshead. The Norman church of S. Mary was restored in 1862, and contains some fine remains of the original building. The chief industries are concerned with engineering, electric power, soap works, and flour mills. Pop. 23,000.

Whiffing. Method of hand-line fishing popular on the coasts of Devon and Cornwall, where large quantities of mackerel are taken in this way. Whiffing is a form of trolling, a spinning bait of bright metal being attached to a line by a gut trace fitted with swivels. To this bait is affixed a small piece of the bright skin cut from the underside of a mackerel. As many as four lines are used at once from one boat, and when the fish are shoaling inshore they may be caught as fast as the lines can be hauled. Whiffing is usually practised under sail, but is sometimes successful from a row-boat. Other fish, such as pollack and bass, may occasionally be caught by whiffing.

Whig. Name used for a political party in England. It is an abbreviation of Whigamore, an opprobrious name of doubtful etymology. The term was originally applied to extreme Scottish Covenanters, especially those from S.W. Scotland. During the struggle over the passing of the Exclusion Bill (*q.v.*), which began in 1679, the term came to be applied, again opprobriously, to the advocates of the bill, who, broadly speaking, were the political descendants of the country party in the Civil War and the period immediately preceding. As with Roundheads and Cavaliers, a term which had at first been an epithet of derision was eventually adopted as a designation by the party itself.

The Revolution of 1688 established the Whigs on a sound foundation as the party which stood for opposition to encroachments by the crown, and for the Protestant succession. It was much strengthened by the accession of the Hanoverian dynasty in 1714, and thenceforward the Whig party enjoyed undisputed supremacy for some 60 years. Long enjoyment of power, however, made it reactionary and corrupt, and eventually it broke up into

factions. During the French Revolution Burke and many other Whigs became virtually Tories, while the more progressive elements headed by Fox assumed the title of New Whigs. These were the political fathers of the later Liberal party. *See* Liberal; Tory.

Whin. Name used in Scotland and Ireland for furze (*q.v.*). The whins on Scottish golf courses provide the best-known application of the term.

Whinchat (*Saxicola rubetra*). Small British migratory bird. The plumage is yellowish-brown on the



Whinchat. Hen of the small migratory bird that nests on the ground

W. S. Berridge, F.Z.S.

upper parts, white on the throat, yellowish-red on the breast, and yellowish-white below. The bird is common in hedgerows and among furze bushes, and builds its nest in a hollow under a tuft of grass. *See* Eggs colour plate; *Saxicola*.

Whin Sill. In geology, a large sheet-like body of dolerite occurring in Carboniferous rocks of Northumberland, Durham, Westmorland, and N. Yorks. It extends over 1,500 sq. m. and has a thickness up to 200 ft. Where it outcrops it forms prominent features and steep valley sides. Hadrian's Wall follows locally the line of one escarpment, and elsewhere the hard sheet of rock forms waterfalls, *e.g.* Cauldron Spout and High Force.

Whin Stone. Term embracing rocks of the basalt and dolerite groups, which are dark and relatively unaltered and are derived from either lava flows or dykes. It is often used by quarrymen for road stone.

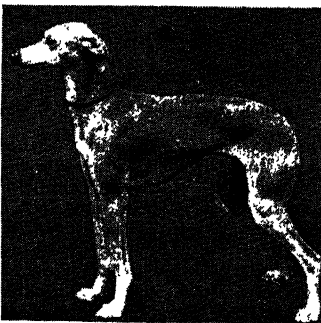
Whip. In British politics, an official whose duty it is to see that the members of his party vote as required. He acts as the intermediary between the leaders and the rank and file, and helps to arrange the business of the assembly to which he belongs. In the houses of parliament each party

has whips who undertake these duties. Government whips are members of the ministry, the patronage secretary to the treasury being the chief whip, and the junior lords of the treasury and the officers of the household his assistants. Whips of parties in opposition are unpaid. Two whips act as tellers when divisions take place on party lines (*see* Division). The chief whip is also the guardian of the party funds, and with his assistants is responsible for keeping the party organization in good condition. Other administrative bodies have officials called whips, *e.g.* the L.C.C.

The term whip is also applied to messages circulated to members warning them to be in their places at a certain time on a particular day, the importance of the occasion being marked by the underlining of certain words, *e.g.* a three-line whip implies urgency, while a five-line whip has been used for debates of the utmost importance.

Whipcord. Stout cloth, usually of cotton or wool, in twill weaves, with the twill lines at a very steep angle to the weft, and showing pronounced ridges and intermediate furrows. A well-known example is officers' khaki riding breeches.

Whippet. Breed of dog produced by crossing the fox terrier with the greyhound and the Italian greyhound. It was admitted to the stud book as a distinct breed by the Kennel Club in 1892. In appearance it resembles a small greyhound with



Whippet. A champion dog of this breed, used for coursing

fox terrier markings, and the best type of animal weighs between 16 lb. and 24 lb. Developing great speed, it is bred largely for rabbit coursing and for racing, especially in the N. of England.

Races are run in heats of six dogs. Each competitor wears a collar of a distinguishing colour,

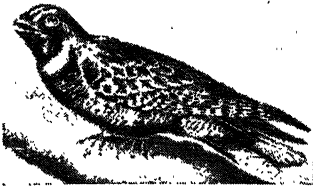
always arranged in this order: red, white, blue, yellow, green, and black. The length of the track is 200 yds., with a surface of cinders or brickdust, though sometimes races are run over grass. Whippets are taught early to worry a rag; and runners, well known to each dog, precede them up the course, waving rags, towards which the animals run. The runners-up must have all passed the winning mark before the dogs are slipped. Each dog is held at its starting mark by a slipper, who throws it into its stride at the sound of the starter's pistol. Whippets are handicapped according to their weight and previous running. *See* Dogs colour plate. *Consult* The Whippet or Race-Dog, F. Lloyd, 1904.

Whipping. Form of corporal punishment. From earliest times whipping was a common form of punishment for many minor offences, though generally reserved for slaves, villeins, and freemen below the rank of gentleman. The culprit was tied to a whipping post or to the tail of a cart and publicly whipped through the streets. The power of a British court to order a person to be whipped was abolished 1948. *See* Flogging; Knout.

Whippingham. Village and parish of the Isle of Wight, England. On the right bank of the Medina, 1 m. S. of Osborne House and 3½ m. N. of Newport, it has a rly. station. The church of S. Mildred, founded in the 12th century, was rebuilt 1861-62; it contains memorials of the royal family and the tomb of Prince Henry of Battenberg. Pop. 2,169. *See* Osborne House.

Whipple, GEORGE HOYT (b. 1878). American pathologist. He was born Aug. 28, 1878, and educated at Yale and Johns Hopkins universities. On graduation he remained a year at the latter as assistant in pathology, and then occupied various research posts, becoming in 1914 professor of research medicine at California university. In 1921 he moved to Rochester university as professor of pathology. In 1934 he shared the Nobel prize for medicine with G. R. Minot and W. P. Murphy because of their discoveries in connexion with the treatment of pernicious anaemia.

Whip-poor-Will (*Antrostomus vociferus*). Species of nightjar, occurring in N. America. The name is derived from the peculiar cry that the bird utters in the night. The whip-poor-will is about 10 ins. long, and has mottled brown plu-



Whip-poor-Will. North American species of nightjar

mage with a white band on the throat. Stiff bristles at the base of the beak are very conspicuous.

Whip Scorpion. Member of the order Pedipalpi, of the class Arachnida. It derives its name from the modification of its first pair of legs into whip-like organs of touch. The tailed whip-scorpions (*Thelyphonidae*), found in N.E. India, W. Indies, and Central and S. America, have a jointed, thread-like tail attached to the last segment of the abdomen. See Pedipalpi; Scorpion.

Whipsnade. Locality of Beds, England. Situated 3 m. S. of Dunstable, it originally formed part of the Ashridge estate. In 1927 Hall Farm, covering 500 acres, was purchased by the Zoological Society and developed

as a park for wild animals and a sanctuary for British wild flora and fauna. During the Second Great War many animals were removed to Whipsnade from the London zoo, and some buildings were slightly damaged by German bombs. Whipsnade has a rly. station, and is common on the crest of the Chilterns affords splendid views.

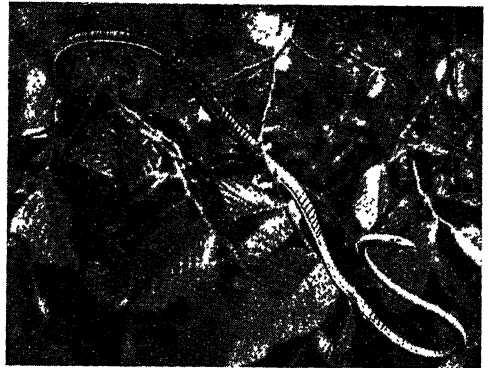
Whip Snake.

Popular name for snakes of the genus *Dryophis*. They occur in the Indian sub-continent and Malaya, and are remarkable for the length and slenderness of the body and tail. They are arboreal in habit, and feed upon lizards

and small birds.

Whirlpool. Circular eddy, vortex, or current in a river, lake, or sea. It is caused by the configuration of the bed or banks, by

the meeting of two currents, by winds, or by the sweeping of a tidal current through narrow, irregular straits or channels. This last cause produces eddies or whirlpools of great dimensions,



Whip Snake. Long-nosed tree snake, *Dryophis mycterizans*, a native of India, among the branches of a tree
W. S. Berridge, F.Z.S.

e.g. the Maelstrom (q.v.) off the Norwegian coast.

Whirlwind. Term applied to a small revolving storm of wind in which the air whirls round a core of low pressure. Whirlwinds are usually short-lived, but there may be violent changes in wind direction. The direction of rotation may be either right to left or left to right, the height sometimes extending upwards many hundred ft. They often originate in the tropics during a hot season, and over desert regions give rise to dust storms. In the Sahara, such whirlwinds will lift and deposit enough sand in a minute to cover a caravan. On the American prairie and in the Australian bush extensive fires are occasionally caused by a whirlwind carrying sparks and fanning the flames. Whirlwinds are occasionally reported in England, e.g. at Folkestone, July 1, 1945; Worcester, Aug. 17, 1948; Grant-ham, Dec. 14, 1948. See Tornado; Waterspout.

Whisky. Intoxicating spirit. Its former name was usquebaugh, meaning in Gaelic water of life. A spirit like whisky has probably been distilled from grain in northern latitudes from very early times, just as brandy has been distilled from wine in the south.

Most distilleries in Scotland use malted barley mixed with a proportion of unmalted barley; but in Ireland whiskey (as it is usually spelt there) is made from a mixed mash of malted and unmalted grain, generally consisting of about 75 p.c. or 80 p.c. barley, and the remainder oats, rye, or wheat. The



Whipsnade. Park in Bedfordshire developed by the Zoological Society to place wild animals in natural surroundings. 1. Camels' reservation. 2. Bears at play. 3. Zebras grazing

latter is simply added to the malt to give it a distinctive flavour. In Scotland the usual method is for two distillations to take place, the first consisting of the wash still. In the lowlands there are often three distillations, the spirit being run off at 40 to 45 o.p. In Ireland three distillations are the general rule.

Newly distilled whisky has a harsh acrid flavour, tasting more like methylated spirits; consequently, it is matured in wooden casks for three years or longer, during which time certain changes take place in the constituents. To quote an old Dublin book, *Truths About Whisky*, the grain products "are not only sources of flavour, but also when sufficiently matured by keeping undergo development into a number of volatile ethers, so subtle that they almost elude chemical analysis, but which are easily discoverable by the nose and the palate, and still more certainly by their capacity to produce exhilaration." See *Distilling*.

Whispering Gallery. Gallery running along the side of a room or other portion of a building, and so shaped that a whisper delivered at one point of the gallery reproduces itself with great distinctness at a distant point. A famous one is in the dome of S. Paul's (*q.v.*) cathedral, London.

Whist. Card game, the parent of a whole family including contract bridge. It originated in the game of trump or triumph played in the time of Henry VIII. The whole pack of 52 cards is used, the ace counting highest, and the other twelve of each suit bearing their usual face value. There are four players, two pairs of partners facing each other. The cards being shuffled and out and the dealer determined, the latter deals them out one at a time, beginning with the player on his left. The last card, which falls to the dealer, is laid face up on the table and shows the trump suit; alternatively, instead of turning up the last card, a second pack is cut to show trumps. Cards in the trump suit are superior in value to any others, but rank in normal order.

The object of the game is to win tricks, one card from each player's hand constituting a trick. First lead is the privilege of the player on dealer's left; thereafter the winner of a trick leads to the next. A player must follow the suit led if he can; if not, he may play any card in his hand. The highest card in the suit led, or the best trump played, takes the trick.

The side taking the most scores one for every trick over six. When honours are counted, if one side holds ace, king, queen, and jack of trumps, it counts four; three of these honours count two. The side first scoring five points by tricks or honours, in one hand or a succession of hands, wins a game, and a rubber is the best of three games. Sometimes whist is played without reckoning honours. At 4-all they never count. In dummy whist there are only three players, one taking dummy, whose cards are exposed upon the table, for partner.

Scientific whist in trained partnerships is an excellent game, but the standard of play fell as the popularity rose of progressive whist and the whist drive. In these forms of play, several people move from table to table according to a prearranged system, usually playing only one hand at each table and marking up the number of tricks won. Prizes are frequently given for highest totals, and most regretably for lowest scores, freak scores, etc. See *Solo Whist*.

Whistle. Sharp, shrill, musical sound created by the forced passage of air through a narrow channel; also the instrument used to produce such a sound. A steam whistle is a sounding device connected with a steam boiler or other source of supply. It was invented in 1826 by Adrian Stephens of Plymouth, to render audible the escape of steam from a safety valve. In one form it consists of a plate with thin edges for deflecting steam through an annular opening against the bevelled rim of a hemispherical or elongated cup or bell.

Whistler, JAMES ABBOTT McNEILL (1834-1903). Anglo-American painter.



James Whistler,
Anglo-American
painter
Self-portrait

He was born at Lowell, Mass., July 10, 1834, the son of a military engineer. In 1851 he was sent to West Point, and thence to the coast survey department at Washington. In 1855 Whistler resolved on an artistic career and, going to Paris, entered Gleyre's atelier. Etchings—the French Set—first occupied him. Having become brother-in-law to (Sir) F. Seymour Haden, he passed the best part of 1859 living and working at etching with that artist. His first painting, *At the Piano*, was refused by the Salon in

1859, and the rejection of *The White Girl* in 1863 determined Whistler to migrate to London.

Meanwhile he had begun the Thames Set of etchings, and had exhibited at the R.A. his earliest painting of the river, *The Thames in Ice*, 1862. About the same time he became strongly influenced by Japanese art, a phase represented by the large *Princesse du Pays de la Porcelaine*, 1865. In 1865 he visited Chile, where he painted two fine pictures of Valparaiso Harbour, and in 1872 came his famous *Portrait of the Painter's Mother*. This was exhibited at the R.A. and was bought for the Luxembourg.

By this time he had begun to paint *Nocturnes*. One of these, exhibited at the Grosvenor Gallery in 1877, stung Ruskin to indignant abuse. Whistler brought a libel action, obtained a farthing damages, and shortly afterwards went bankrupt, but took revenge in his *Whistler v. Ruskin* pamphlet. This was followed by the *Ten-o'clock Lecture*, 1885, and *The Gentle Art of Making Enemies*, 1890, in which he revealed himself as a caustic controversialist. In social circles he was already known as a wit. In 1884 he had joined the Society of British Artists, of which he was elected president in 1886, but his difficult temperament, not less than his carelessness in financial matters, led to his abandonment of the chair and the society in 1888. From 1898 he was president of the International Art Society. He died at Chelsea, July 17, 1903.

Among works not already cited are portraits of Miss Alexander, Carlyle, and Sarasate; *The Blue Wave*, Biarritz; *Old Battersea Bridge* (Tate Gallery). His etchings and lithographs are unique in their dainty craftsmanship. Characteristic of him were his fancy of naming his pictures as composers name their works, e.g. *Symphony No. 2*, in white, which served to stress the artistic quality of the paintings rather than their subject-matter; and his famous monogram signature, which gradually became a butterfly. See *Etching*.

Bibliography. *The Art of Whistler*, T. R. Way and G. R. Dennis, 1903; *Whistler As I Knew Him*, M. Menpes, 1904; *Life*, J. and E. R. Pennell, 1908; *The Whistler Journal*, J. and E. R. Pennell, 1921; *Whistler*, J. Laver, 1930.

Whistler, REX JOHN (1905-44). British painter and designer. Born in London, June 24, 1905, he was educated at Haileybury, and studied at the Architectural

Association, the Slade school, and in Rome. His work showed unusual verve and fine craftsmanship, and he became well-known as a muralist with a series of frescoes in the Tate Gallery restaurant. His stage sets, e.g. *The Marriage of Figaro*, and *The Rake's Progress*, had a mock-Baroque manner and vivid decorative detail. He was designer also for the London and New York productions of *Victoria Regina*, 1936. Notable book illustrations were for the Cresset Press edition of *Gulliver's Travels*. Whistler's portrait of Edith Olivier is in the Tate Gallery. He was killed in Normandy July 18, 1944, during the Second Great War. A Life, by L. Whistler, appeared in 1948.



Rex Whistler,
British artist

Whitaker's Almanack. British annual work of reference. Founded by Joseph Whitaker (1820-95) in 1868 for the following year, it has become the most comprehensive handbook in the country. It has been issued since 1887 with various editions and supplements, the largest of which contains much statistical information about all countries.

Whitbread, SAMUEL (1758-1815). British politician. Born at Cardington, Beds, the son of a brewer, he was educated at Eton, Christ Church, Oxford, and S. John's College, Cambridge. He was Whig M.P. for Bedford from 1790. A vigorous opponent of Pitt and friend of



Samuel Whitbread,
British politician
After Opie

Fox, he was an advocate of peace, poor law reform, popular education, and national economy; opposed the slave trade, conducted the impeachment of Melville for alleged malversation while treasurer of the navy, and took part in the inquiry into the conduct of the duke of York. Whitbread died by his own hand, July 6, 1815. Consult *Memoirs of the Whig Party*, 3rd Lord Holland, 1852.

Whithy. Urban dist., seaport, market town, and suffragan bishopric, in the N. Riding of Yorks, England. Situated at the mouth of the Esk, 20 m. N.W. of Scar-

borough, it is served by rly., and is a popular seaside resort. The parish church of S. Mary is a large building with fine Norman work, box pews, and a three-decker pulpit; round the interior run eight galleries. A cross was erected in the churchyard, 1898, to commemorate Caedmon (q.v.), who was a monk at the abbey. Interesting features are the old toll booth,

pieces until only portions of the shell exist. Its ruins were transferred to the nation in 1920. The



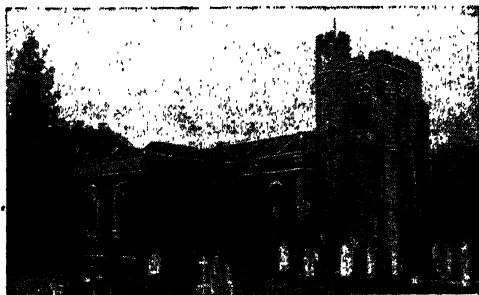
Whitby, Yorkshire. The West Pier with the Abbey and S. Mary's church on the East Cliff. Top, ruins of the ancient Benedictine abbey, from the south-west

piers, lighthouses, Capt. Cook's house, and the museum and art gallery. The Esk is spanned by a swing bridge, and forms a small tidal harbour which shelters a large fishing fleet. Shipbuilding is an ancient industry of the town, and the craft of making jet ornaments is still carried on. The modern holiday resort occupies the W. cliff, with a spa, promenade, gardens, and sports grounds. Here is a statue of Capt. Cook.

The most famous object in the town is the ruined abbey, founded by S. Hilda in 657, and one of the earliest homes of English learning. The original building was destroyed by the Danes in 867, but was restored as a Benedictine abbey in the time of Henry I. Standing exposed to the weather, 200 ft. above the sea, it has fallen to

town was shelled by a German battle-cruiser squadron on Dec. 16, 1914, and in 1940 the council offices were destroyed in an air raid. Market day, Sat. Pop. est. 11,690.

Whitchurch. Parish of Middlesex, England, in Harrow urban dist. Known also as Stanmore Parva and Little Stanmore, it lies $\frac{1}{2}$ m. W. of Edgware (q.v.). From the time of Henry III until the dissolution the manor belonged to the priory of S. Bartholomew, Smithfield. Under the name of Canons and Wimborough in Whitchurch it was granted in 1554 to Sir Hugh Losse, and passed eventually to the duke of Chandos, who here built the grandiose mansion known as Canons (q.v.)



Whitchurch, Middlesex. Parish church of S. Lawrence where Handel was organist, 1718-21

and rebuilt in 1715-20 the body of the church of S. Lawrence, of which Handel was organist 1718-21. In the churchyard is the grave of William Powell (d. 1780), the "harmonious blacksmith," who was parish clerk in Handel's time.

Whitchurch. Urban dist. and market town of Shropshire, England. Situated 19 m. N. of Shrewsbury, near the borders of Cheshire and Wales, it is a rly. junction. The parish church of S. Alkmund, rebuilt in 1713, contains the tomb of John Talbot, 1st earl of Shrewsbury (1388-1453). There are brewing and cheese-making, and a monthly cheese fair. Market day, Fri. Pop. 6,016.

Whitchurch. Parish of Glamorganshire, Wales. It is 1½ m. N. of Llandaff, and stands on the site of an ancient Roman camp. The principal industry is in iron and tinplate works. Pop. 25,000.

Whitcombe. Name of a family of English professional golfers. Three brothers, natives of Somerset, won almost every title between them and in 1935 all played in the Ryder Cup match against America. Ernest Reginald (b. 1890), professional at Meyrick Park, Bournemouth, was perhaps the steadiest; he played in four Ryder Cup matches, and won the Brighton tournament in 1937 with the remarkable score of 268 (64 in the last round). Charles Albert (b. 1895), long professional at Crews Hill, won the Vardon trophy in 1937 for the best average in major events (71-62 for 24 rounds); tied with Henry Cotton at the head of the Penfold league in 1939; was third in the open championship of 1935; and six times in the Ryder Cup team, twice captain. Reginald Arthur (born 1898), professional at Parkstone, was open champion in 1938 after being second to Cotton the previous year. Gaining the Vardon trophy in 1939, he was regarded as the most dashing of the trio. Another member of the family, Ernest Edward (b. 1913), beat a field containing his father Ernest and his uncle Charles to win the Bramshot tournament of 1936.

White. River of the U.S.A. It rises in the Boston Mts., in Arkansas, and flows N. into Missouri, where it turns S.E. and flows through Arkansas to the Mississippi, near the mouth of the Arkansas. It is about 800 m. long, nearly half its course being navigable.

White, Sir George Stuart (1835-1912). British soldier. Born in co. Antrim and educated at

Sandhurst, he first saw active service during the Indian Mutiny in 1857. In the second Afghan War, 1878-80, he won the V.C.; and he was in the Nile Expedition, 1884, and the Burmese War, 1885-87. In 1893 White became commander-in-chief in India. During the S. African War he made a memorable defence of Ladysmith until relieved by Buller on March 1, 1900. He was governor of Gibraltar, 1900-04. In 1903 he was made a field-marshal, and he died June 24, 1912. A statue stands in Portland Place, London, W.1. See Ladysmith, Siege of.

White, Gilbert (1720-93). British naturalist. He was born at Selborne, Hants, July 18, 1720, and was educated at Oriel College, Oxford. Ordained in 1747, he held curacies at Selborne and elsewhere, and devoted himself to the study of the natural history



Gilbert White,
British naturalist

and antiquities of his native parish. He died June 26, 1793. His life was entirely uneventful, and he was little known till near its close, but in 1789 he published his letters to Pennant and Barrington in the form of a volume, *The Natural History and Antiquities of Selborne*, which has become the most widely read book on English natural history ever produced. White observed everything in animal and plant life and the weather, describing them in a style of charming simplicity. His *Journals* were edited by W. Johnson, 1931. See Selborne illus. *Consult* Life and Letters, R. Holt-White, 1901; *Life and Times*, W. S. Scott, 1946.

White, Henry Kirke (1785-1806). British poet. Born in Nottingham, March 21, 1785, the son of a butcher, he was articled to a firm of lawyers, and devoting his leisure to study, published in 1803 a volume of poems entitled *Clifton Grove*, which won the praise of Southey.

Deciding to take orders, White proceeded to S. John's College, Cambridge, where the promise of a brilliant career was cut short by his death from



After J. Hoppner

consumption on Oct. 19, 1806. White's poetry gained the appreciation of Byron, but posterity has failed to endorse this favourable verdict. His hymn, *Oft in Danger, Oft in Woe*, is still sung.

White, John (1576-1618). An English monk. Born near Worcester, he went to Spain at the age of 20, and three years later became a Benedictine monk, taking the name of Augustine. In 1602 he returned to England as a missionary, then being known as Bradshaw. His plans for training English members of the order led to the foundation of the college of Douai in 1605, when White was made chaplain-general to the English forces in Flanders under Arundel. After overcoming the opposition of the Jesuits, White also secured the foundation in 1607 of the monastery at Douai, transferred after the French Revolution to Downside. White died near Rouen, May 4, 1618.

White, Joseph Blanco (1775-1841). British author. Born at Seville of an Irish family, July 11, 1775, and educated at Seville university, he was ordained a priest in 1800. Gravitating towards free thought, he came to England in 1810, regained his faith, and took Anglican orders. Again afflicted with doubts, he finally, under the influence of Dr. Martineau, embraced Unitarianism. He is best remembered by his fine sonnet on *Night and Death*. His works include *Letters from Spain*, 1822, and *Second Travels of an Irish Gentleman in Search of Religion*, 1833. His death occurred in Liverpool, May 20, 1841.

White, Maude Valérie (1855-1937). British composer. Born of British parents at Dieppe, June 23, 1855, she entered the R.A.M. in London, 1876, and won the Mendelssohn scholarship there three years later. She travelled widely in Europe and S. America, and became known as a writer of melodious and fluent songs and ballads. Herrick's verse inspired many settings, and her part-song ar-



Joseph Blanco White,
British author



Maude Valérie
White,
British composer

rangement of Byron's So we'll go no more a-roving is familiar. She composed a Mass, 1888, and a number of short pianoforte pieces. She wrote two books of reminiscences, *Friends and Memories*, 1914; *My Indian Summer*, 1932. She died Nov. 2, 1937.

White, WILLIAM ALLEN (1868-1944). American editor. Born Feb. 10, 1868, at Emporia, Kansas, he attended a town school and the state university, supporting himself by setting type in local offices. In 1893 he obtained control of the *Emporia Gazette* and as owner-editor gained for it



White Arum. Leaves and spadix of flowers, surrounded by spathe. Left, unopened spathe

an influence out of proportion to its small circulation, especially with an article, *What's the Matter with Kansas?* A Republican in politics, he was an ardent supporter of Theodore Roosevelt, and a generous if sometimes critical advocate of Franklin Roosevelt's New Deal. In 1940 White became chairman of the committee to defend America by aiding the Allies, although himself believing that the most valuable service his country could render was to stay out of war. The most conspicuous editor of the *Middle West*, he travelled widely, attended the peace conferences in Paris in 1919, won the Pulitzer prize for the best editorial of 1922, and wrote *Lives of Wilson* (1924) and *Coolidge* (1925), also an autobiography (1937). He died at Emporia, Jan. 29, 1944.

White, WILLIAM HALE (1831-1913). British novelist, better known by his pseudonym Mark Rutherford (*q.v.*).

White, SIR WILLIAM HENRY (1845-1913). British naval architect. Born at Devonport, Feb. 2, 1845, and educated at the Royal School of Naval Architecture, he was professor there 1870-81, and then made chief constructor of the

Admiralty. In 1883 he joined Sir William Armstrong and designed a number of battleships, returning in 1885 to the Admiralty as director of naval construction, a post he held till 1902. He brought about the use of turbine engines in cruisers, and revolutionised the design of battleships. He wrote a *Manual of Naval Architecture*, 1877; and *Architecture and Public Buildings*, 1884. Knighted 1893, he died Feb. 27, 1913.

White Ant. Popular name for the insect more correctly called termite (*q.v.*).

White Army. Name given to the Russian forces which served under Gens. Denikin, Koltchak, Wrangel, and Yudenitch (*qq.v.*) in 1919-20 against the Red army of the Bolshevik revolutionaries (see Russia: History, p. 7176). It should not be confused with the White Russian armies of the Second Great War, so named from the area of Russia in which they first fought the Germans, and commanded by Rokossovsky, Zhukov, Chernyakhovsky, and other distinguished soldiers.

White Arum, ARUM LILY, OR TRUMPET LILY (*Richardia africana*). Perennial marsh herb of the family Araceae, native of S. Africa. It has a thick rootstock from which all the large arrow-shaped leaves arise on long stalks. The small yellow flowers are crowded round a spadix as in wake robin, surrounded by the lower part of the large, pure white spathe, which is popularly regarded as the flower. See Wake Robin.

Whitebait. Young of herrings and sprats, a table delicacy. The fishery is carried on about river estuaries—notably that of the Thames—and usually lasts from March till Aug. The early catches consist almost entirely of young sprats, the herring fry making their appearance later in the season.



White Beam
OR CHESS APPLE
(*Pyrus aria*). Small tree of the family Rosaceae. It is found native in Europe, N. and



White Beam. Leaves and fruit of the small tree. Above, flower cluster

W. Asia, and N. Africa. The trunk has smooth bark, which remains without longitudinal fissures until maturity. The thick simple leaves are very variable, broad oval or lobed with toothed edges. The underside is thickly coated with white hairs. White flowers are in flat clusters, and green-dotted scarlet fruits are as big as holly berries. The wood is hard and fine-grained.

Whiteboys. Term applied to Irish desperadoes who came into prominence during the agricultural depression which set in during the latter half of the 18th century in Ireland. They were particularly numerous in Tipperary and Limerick, and were responsible for many outrages about 1765. Checked for a time by the formation of bands of volunteers, the Whiteboys again gave trouble in 1786, this time in Munster, where they murdered Protestant clergymen. Suppressed again by the military, aided by volunteers organized by the local gentry, the Whiteboys were scarcely heard of until 1821-23, when there was a recrudescence of crime. Their name is perpetuated in the Whiteboy Acts, enactments made between 1775 and 1831, giving powers for the suppression of dangerous associations in Ireland.

Whitechapel. Dist. of London. Part of the met. bor. of Stepney (*q.v.*), it lies E. of Aldgate and was



Whitechapel, London. Church of St. Mary, gutted by German bombs, 1941

constituted a parish in the 17th century. The parish church of St. Mary, once known as St. Mary Matfellow, is mentioned in 1280; rebuilt 1675, 1875, and 1882, it was rendered derelict by German bombs in 1941. Adjoining St. Jude's, which is associated with

the work of Canon Barnett (*q.v.*), and containing a mosaic by Watts, is Toynbee Hall (*q.v.*). In the High Street is Whitechapel art gallery, 1901. This district, which up to 1950 had its own M.P., is a famous Jewish quarter.

White City. THE. London exhibition site at Shepherd's Bush. The buildings, faced with highly decorative stucco, were constructed for the Franco-British exhibition of 1908, and later used for other exhibitions. Taken over by the govt. during the First Great War, the buildings later fell into decay. The site was acquired by the B.B.C. in 1949, the only relics of the original "city" being the White City stadium, and the name of two London Transport stations. *See* Stadium.

White Dwarf. One of a small class of stars of very low luminosity in spite of a high surface temperature. The best-known example is the faint companion of Sirius. Most white (*i.e.* hot) stars are some 50 or 100 times brighter than the sun, but white dwarfs may be 10,000 times fainter than the sun, or equal to the faintest red stars. This intrinsic faintness must be due to small size. The white dwarfs are therefore stars of ordinary stellar mass but of planetary dimensions, and must consist of matter of density about 50,000 times that of water.

Whitefield. Urban dist. and parish of Lanes, England. Also known as Stand, it is $5\frac{1}{2}$ m. N. of Manchester and adjacent to Prestwich, with two stations on an electric rly. It is a residential area in an industrial dist. Pop. 12,620.

Whitefield, GEORGE (1714-70). English preacher. Born at Gloucester, Dec. 16, 1714, the son of an innkeeper, he was educated at Pembroke College, Oxford, where he was a servitor. At Oxford he became friendly with John and Charles Wesley, and in 1736 he was ordained in the Church of England. In 1737 he followed the Wesleys to Georgia, where he founded an orphanage, but he was soon in England again, and became widely known as a preacher to enormous audiences, chiefly in the open air, for the clergy in the main disliked his methods.

On his return from another visit to America (1739-41) Whitefield's stern Calvinism led to a break with the Wesleys, and in 1741 a tabernacle was built for him in Moorfields, London. He preached there, finding time also for evangelistic tours, of which the Scottish ones were especially successful,

until 1744, when he made another journey to the U.S.A. He returned in 1748, became chaplain to the countess of Huntingdon, and was provided with a new preaching centre (*v.i.*) in Tottenham Court Road, London.

His missionary journeys were continued until his last visit to America, on which he died, at Newburyport, Mass., Sept. 30, 1770, and was there buried. The type of Methodism preached by Whitefield developed into the Calvinistic Methodist Church. His many writings include a Journal. A greater orator than Wesley, but inferior as an organizer, Whitefield was a preacher to whom the religious revival of the 18th century owes much. *See* Huntingdon, Countess of; Methodism. *Consult* Select Works, ed. J. Smith, 1850; Lives, L. Tyerman, 1876-77; J. P. Gledstone, 1900; A. Belden, 1930.

Whitefield's Tabernacle. Name of several London places of worship. In 1741 a large temporary shed known as the Tabernacle was erected in Moorfields for George Whitefield. It was replaced by a brick building on the same site, opened June 10, 1753. On Nov. 7, 1756, Whitefield opened a chapel in Tottenham Court Road, long known as Whitefield's Tabernacle, which later passed to a Congregational body, by whom it was rebuilt in 1899. On March 25, 1945, it was destroyed by one of the last German rocket bombs of the Second Great War.

Whitefish. Popular name used chiefly in N. America for fishes of the genus *Coregonus* of the salmon family. Although mostly fishes of large fresh-water lakes, a few species are anadromous and migrate to the sea. They are found also in the cold and temperate parts of Europe and Asia, and three species occur in the British Isles. They have the adipose back fin characteristic of salmonoid fishes; scales of moderate size which are detached readily; the mouth open-



Whitefield

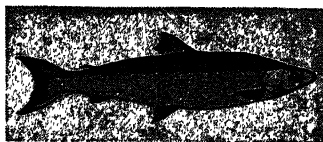
ing is small, and most of the minute teeth are shed before maturity. The vendace (*C. vandesius*), which is only 6 ins. to 9 ins. long, is found in Bassenthwaite and Windermere, the Solway Firth, and around Lochmaben. Its flavour suggests that of the smelt. The pollan (*C. pollan*), very similar to the gwyniad, is known only from Lough Neagh and other Irish lakes, where it occurs in vast schools. Though it attains a length of a foot, it is more commonly taken at half that length.

White Flag. Emblem exhibited by a belligerent who wishes to surrender. The agent chosen for parley, if one was held, was traditionally accompanied by a flag-bearer, an interpreter, and a trumpeter. In military circles such a party was often called a flag of truce. *See* Truce.

White Fly. Name given to very small insects of the family Aleo-didae of the order Hemiptera. They have membranous wings powdered with a fine waxy exudation. The nymphs are flat and scale-like. Several kinds are destructive to cultivated plants, especially the common greenhouse white fly (*Asterochloa vaporariorum*).

Whitefriars. Dist. of London. It lies S. of Fleet Street (*q.v.*) between the Temple and New Bridge Street, and contains the City of London School, Sion College, Guildhall School of Music, S. Bride's church (damaged in the Second Great War), and offices of several daily and weekly newspapers and news agencies. A crypt of the Carmelite priory was found in Britton's Court. *See* Alsatia.

Whitehall. London thoroughfare. It connects Charing Cross with Parliament Street, S.W.1. On the E. side are the War office, and the banqueting hall built by Inigo Jones, from a window of which Charles I stepped out on to the scaffold. This hall now houses the Royal United Service Institution and museum. On the W. are the Whitehall Theatre (*v.i.*), the old Admiralty, the Horse Guards, government buildings, and Downing Street. In the roadway stand the Cenotaph and statues of the 2nd duke of Cambridge and 1st Earl Haig. Whitehall, in 1529-1697 the chief residence of the court in London, takes its name from the palace built by Henry VIII and destroyed by fire in 1698. Of a new palace contemplated by James I, only the banqueting hall was erected, 1622. The name Whitehall is used as a synonym for the British government in its adminis-



Whitefish. The pollan, a small fish found only in the Irish lakes

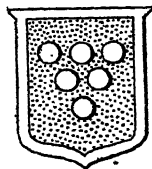
trative aspect. See Cenotaph: Home Office; Horse Guards. Consult The Old Royal Palace of Whitehall, J. E. Sheppard, 1902.

Whitehall Theatre.

London playhouse, in Whitehall, S.W.1. Seating 620, it was opened Sept. 29, 1930, under the ownership and management of Walter Hackett (q.v.),

whose comedy, *The Way to Treat a Woman*, was the first production. In his *Road House*, 1933, he and his wife Marion Lorne appeared. Other successes included *Anthony and Anna*, 1935; *The Moon is Down*, 1943; *Worm's Eye View*, 1945. Here also Phyllis Dixey staged "strip-tease" entertainments.

Whitehaven. Mun. bor., seaport, and market town of Cumberland, England. It is in the heart of a coal-mining dist., 8 m. S. by W. of Workington, and is served by rly. Built round a small, sheltered bay, it has been a useful seaport since the 17th century, when the



collieries were developed. Coal, iron, stone, and lime are exported. The mines in the neighbourhood run a considerable distance beneath the sea. In the William Pit disaster, Aug. 15, 1947, over 100 men lost their lives. There are three parish churches, other buildings including town hall, cinemas, etc. The harbour is protected by piers on the N. and W., that on the latter terminating in a lighthouse. The principal manufactures are bricks, tiles, drain pipes, silk goods, flour, and clothing. Paul Jones landed here in 1778. A German submarine bombarded the town in 1915. Market days, Thurs. and Sat. Population 21,142.



Whitehall, Westminster. View looking north, showing the Home Office on left opposite the Cenotaph. The War Office, with twin turrets, is on the right

to Trinity College, Cambridge, where he had a brilliant career, being fourth wrangler. Fellow and lecturer in mathematics at his college during 1885-1911, he left to lecture in applied mathematics at University College, London, and in 1914 was appointed professor of applied mathematics at the Imperial College of Science. Meanwhile his massive three-volume treatise, *Principia Mathematica*, written in collaboration with Bertrand Russell (q.v.), had made him a dominating figure in the disputed territory between mathematics and philosophy.

In 1924 Whitehead went to Harvard as professor of philosophy, and thenceforth lived in the U.S.A., though he frequently returned to Great Britain to lecture or take part in conferences. His most famous books were the trilogy, *Science and the Modern World* (1925), originally delivered as the Lowell lectures at Harvard; *Process and Reality* (1928), Gifford lectures in Scotland; and *Adventures of Ideas* (1934). These provide a detailed exposition of the philosophy he advocated in part in many lesser works. F.R.S. from 1903, Whitehead was awarded the O.M. in 1945. He died at Cambridge, Mass., Dec. 30, 1947.

Whitehead's philosophical outlook he himself described as the doctrine of organism. For him the world is essentially a process. The elements making up that world are events, and what we call things are merely complexes of events. Reality is to be found in growth; the mechanical view of nature, so general in Whitehead's youth, he found unsatisfactory, though he admitted that it had produced valuable results in science. He substituted for it a biological view, and was called the greatest Platonist of his generation.

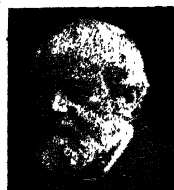
John Rowland

Whitehead, GEORGE (c. 1636-1723). English Quaker. Born near Orton, Westmorland, he was converted to Quaker beliefs by George Fox. In 1654 he became an itinerant preacher, and was imprisoned on numerous occasions. His fame spread rapidly, and he was embroiled in many controversies, writing tracts to vindicate his faith. At the reading of the anti-Quaker bill of 1661 he represented the Friends in the house of commons. In prison for almost the whole period from then until 1672, he worked hard to secure the temporary indulgence which resulted in Bunyan's release. Whitehead was the most frequent pleader with Charles II and James II on behalf of the Quakers, and he was largely responsible for securing the Act of Toleration after the accession of William and Mary. He then set himself to clear up the misunderstanding over ideas of the Quakers in a series of pamphlets, and was still active when he died, March 8, 1723, having pleaded in person with seven English sovereigns.

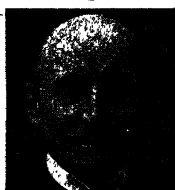
Whitehead, SIR JAMES (1834-1917). British philanthropist. Born March 2, 1834, and educated at Appleby grammar school, he settled in London, and as lord mayor for 1888-89 was instrumental in settling the great dock strike. Made a baronet, 1889, he was Liberal M.P. for Leicester, 1892-94, and one of the founders and first president of the British (later Lister) institute of preventive medicine. He died Oct. 20, 1917.

Whitehead, ROBERT (1823-1905). British inventor. Born at Bolton-le-Moors, Lancs, Jan. 3, 1823, and apprenticed to a Manchester engineering firm, he went in 1844 to Marseilles, and in 1847 to Milan, where he made improvements in silk-weaving machinery. In 1856 he settled in Fiume as the designer of engines for warships, and in 1866 brought out the invention which made him famous, the Whitehead torpedo. He died Nov. 14, 1905. See *Torpedo*.

White Hellebore (*Veratrum album*). Perennial herb of the family Liliaceae. A native of Europe and Siberia, it has a thick, creeping rootstock that yields a poison, protoveratrine. The lower leaves are oblong, and the upper ones progressively narrower. The



Robert Whitehead, British inventor



A. N. Whitehead, British philosopher

Whitehead, ALFRED NORTH (1861-1947). British mathematician and philosopher, born at Ramsgate, Feb. 15, 1861. From Sherborne he went

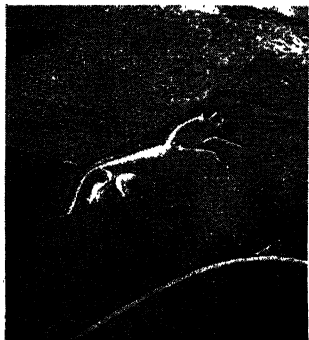


White Hellebore. Clustered flowers.
Inset, lower leaves and roots

whitish flowers cluster around the upper part of the downy stem.

White Horse. Design of a horse formed by removing turf from the chalk downs of S. England. The most famous is above Uffington, Berks, a figure 374 ft. long which may be prehistoric, though local tradition makes it date from Alfred's reign in celebration of his victory over the Danes in 871. In Tom Brown's Schooldays there is an account of the ancient festival known as the scouring of the horse. White Horse Hill rises steeply to 856 ft. and has ancient earthworks; it is crossed by the Ridgeway. Through the Vale of the White Horse runs the main rly. to Swindon; Wantage is the chief place in the vale, which contains several beautiful villages, e.g. East Hendred. Chesterton's Ballad of the White Horse is permeated with the local legends.

There are six white horses in the neighbouring county of Wilts. That at Westbury, on Bratton Hill, is 175 ft. long, and was cut in 1778 to replace a more primitive design. The others, all modern, are near Alton Barnes, Broad Hinton, Cherhill, Marlborough, and Wootton Bassett.

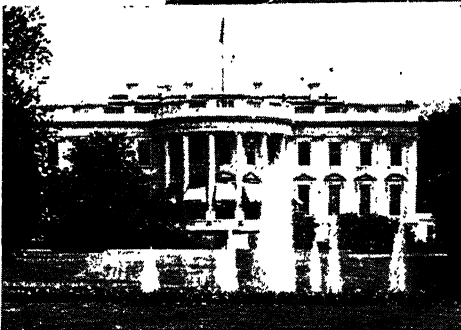


White Horse. Famous example of these designs, in the downs above Uffington, Berks

White Horse. Town of Canada, in Yukon. It stands at the White Horse rapids on the Yukon river and is the terminus of the White Pass and Yukon rly. from Skagway, Alaska. Pop. 540.

White House, THE. Official residence, in Washington (q.v.), of the president of the U.S.A. Built in English Renaissance style, of freestone, its foundation stone was laid by George Washington. On Aug. 24, 1814, the interior and part of the walls were burned by British forces which had

through the 7th square in the game of chess being played. He is famous for crazy inventions and lunatic logic (e.g. carrying his box upside down so that the rain cannot get in), and sings the song A-Sitting on a Gate. The White King and White Queen are other fantastic characters.



White House. Front view (top) and garden view of the official residence in Washington of the President of the U.S.A.

Whiteladies. Ruined nunnery in Shropshire, England. It is near Boscombe and was founded towards the close of the 12th century by the Cistercians. It was called Whiteladies to distinguish it from the Dominican convent in Staffs called Blackladies. There are scanty remains.

captured the city. On reconstruction the exterior was painted white. The building was first occupied in 1800 by John Adams, and has been the residence of all subsequent presidents. The name is used as a synonym for the U.S. government.

Whiteing, RICHARD (1840-1928). British novelist. Born in London July 27, 1840, he wrote for many years for the Manchester Guardian and the Daily News. His reputation as novelist rests primarily on No. 5, John Street (1899) an arresting study of sium life in London. He wrote also a satiric novel, The Island, 1888; The Yellow Van, 1903; Little People, 1908; My Harvest, 1915; and, with Genevieve Ward, Both Sides of the Curtain 1918. He died June 19, 1928.



Richard Whiteing
British novelist

White Knight. Character in Through the Looking Glass, by Lewis Carroll. He conducts Alice

White Lady. Designation of various legendary apparitions, generally associated with the destinies of noble houses. They are sometimes supposed to give warning of an impending death, as in the royal houses of Bourbon and Hohenzollern. In Scott's The Monastery, the White Lady of Avenel is a family spirit. White Lady is also the name of a cocktail.

White Lead. Hydrated basic carbonate of lead, $2\text{PbCO}_3\cdot\text{Pb}(\text{OH})_2$. It was made artificially as early as 400 B.C. by soaking lead in vinegar and converting the acetate formed to basic carbonate by the action of carbon dioxide. Later the process was carried out in stacks of pots, each pot containing vinegar and metallic lead, the whole being embedded in a fermenting substance such as spent tanner's bark, which supplied the necessary heat, moisture, and carbon dioxide. This stack process was the only important one till recent times; it reached its highest development in Holland about the 17th century, and the substance produced by it is still called Dutch white lead.

White lead is a heavy pigment of good opacity and durability. Being basic it tends to react with the oil media, though not so much as zinc white does. The film is somewhat soft but of good protective value, and white lead is still the basis of most good decorative outside paints. Mixed with zinc oxide, it gives in many respects a more satisfactory outside paint than either alone. In the presence of sulphuretted hydrogen, white lead becomes darkened by the formation of black lead sulphide; this, however, eventually oxidises to the white sulphate. The toxicity of white lead is attributed to the dust of the dry pigment. Its manufacture and use are therefore controlled by the government.

Whiteleg (*Phlegmasia dolens*). Disease occurring during pregnancy or, more commonly, just after delivery. It is characterised by pain, swelling, hardness, and whiteness of the surface of one or both legs. It is due to obstruction of the veins and lymphatic vessels, resulting from septic absorption. Most cases recover, but permanent varicosity of the veins may follow. Treatment consists in keeping the leg absolutely at rest in an elevated position for at least six weeks.

Whiteley, WILLIAM (1831-1907). British merchant, born at Agbrigg, Yorks, Sept. 29, 1831.



William Whiteley,
British merchant

In 1863 he opened a small fancy drapery shop in Westbourne Grove, Bayswater, London. By adhering to a trading policy which gave small profits, and by displaying his goods in an unusually attractive style, he steadily increased his business. By 1899 his establishment had so expanded that profits averaged £100,000 per annum; and in that year Whiteley's was turned into a limited company. Whiteley died Jan. 23, 1907, after being shot in his office by Horace Rayner, to whom he had refused monetary assistance. *Consult* The Universal Provider, R. S. Lambert, 1938.

Whitelocke, BULSTRODE (1605-75). English lawyer and politician. He was born in London, Aug. 6, 1605, educated at Merchant Taylors' and St. John's College, Oxford, and called to the bar at the Middle Temple, 1626. He represented several constituencies in parlia-

ment, was chairman of the committee that prosecuted Strafford, and sat on the committee appointed to draw up the charge against Charles I, though he took no part in the trial. A commissioner of the great seal, 1648, 1649, 1654-55, and 1659, he was ambassador to Sweden, 1633-54. After the Restoration Whitelocke lived in retirement, dying July 28, 1675. He wrote *Memorials of English Affairs* (1625-60), publ. 1682; *Journal of the Swedish Embassy*, publ. 1772. *Consult* Memoirs, R. H. Whitelocke, 1860.

Whiteman, PAUL (b. 1893). American band leader. Born into a musical family at Denver, he played the violin in his father's orchestra at 10. In 1915 he was in the World's Fair orchestra under Victor Herbert, and his own jazz band was started in 1919, the pianist Ferdy Grofé soon experimenting with unheard-of orchestrations. Whiteman's band came to the London Hippodrome in 1923; next year saw his first concert at the Aeolian Hall, N.Y., when he first presented *Rhapsody in Blue*. In 1927 he discovered Bing Crosby, until then unknown. The 1930 film *King of Jazz* was the peak of Whiteman's success, and thereafter his contribution to entertainment was mostly the commercialising of jazz. Bix Beiderbecke, Tommy and Jimmy Dorsey, Eddie Lang, Joe Venuti, Jack Teagarden, and Johnny Mercer all played with Whiteman.

White Metal. Term with two distinct metallurgical applications: (1) A group of tin-base alloys used for the manufacture of bearings in all branches of the engineering industry; those alloys whose principal constituent is tin commonly contain varying amounts of copper, antimony, and lead, and they have remarkable anti-friction properties. (2) The copper sulphide produced in the first stage of converting a copper matte to blister copper; its first appearance indicates that all the iron has been oxidised and transferred to the slag.

White Mould (*Peronospora*). Genus of parasitic fungi of the family Peronosporaceae. They attack living plants; the delicate threads (hyphae) run through the spaces in the cellular structure of



Bulstrode White-
locke,
English lawyer

their hosts, and the spore-bearing branches issue through the breathing pores (stomata) as erect white threads bearing at their extremities the reproductive bodies. Different species attack different hosts: e.g. *P. schleideniana* is the onion mould; *P. nireu*. parsnip mould.

White Mountains. Group of the Appalachian system in the N.W. of New Hampshire, U.S.A. They extend from the valley of the Androscoggin river in a S. direction to Squam Lake, but in a broader interpretation include several other small groups within the state. The loftiest summits occur in the Presidential Range, where Mount Washington reaches 6,293 ft.

White Nile. Name for that part of the Nile between its confluence with the Bahr-el-Azrek and Lake No, called by the Arabs Bahr-el-Abiad (q.v.). White Nils province was formerly a division of the Anglo-Egyptian Sudan, on both sides of the middle portion of the White Nile. The capital was El Duseim. Huge quantities of papyrus occur. *See* Nile.

White Paper. Name given to official documents issued by the British Treasury, Foreign office, and other govt. depts. *See* Blue Book.

White Pass. Pass of N. America, on the border of Canada and Alaska. It has an elevation of 2,886 ft. in the Kotusk Mts., and is used by the rly. and other routes from the Skagway river and Chilkoot Inlet to the goldfields of the Klondike.

White Plains. City of New York, U.S.A., the co. seat of Westchester co. It is 23 m. N.N.E. of New York City, of which it is a dormitory suburb, served by the New York Central and other rlys. Here on Oct. 28, 1776, was fought a battle in the War of Independence. Pop. 40,327.

White Russia. European republic of the U.S.S.R. It has no coastline, being bounded by Latvia and the R.S.F.S.R. on the N., the R.S.F.S.R. on the E., Ukraine on the S., Poland and Lithuania on the W. The W. of the present White Russia was conquered by Poland in 1920 and ceded to her under the treaty of Riga, 1921. reoccupied by Russia in Sept., 1939, it was reincorporated in White Russia on Nov. 2 that year. Poland accepted this change under the Russo-Polish treaty of 1945. White Russia is 81,090 sq. m. in area. Its pop. in 1940 was about 10½ millions, some 80 p.c. of whom were White Russians 10 p.c.

Jews, the remainder Russians, Ukrainians, and Poles. Minsk (238,772) is the capital.

The Dvina traverses the N. of the country, while the Dnieper and its tribs. the Beresina and Pripet drain the S. White Russia is a fairly level country, with some hills, and slopes generally from N. to S., where the extensive Pripet Marshes lie to the W. along the valley of that river. The rainfall is somewhat heavier, and the temp. more equable, than are those of the R.S.F.S.R.

Principally an agricultural region, although the soil is nowhere very fertile, White Russia developed some industry during the years between the revolution and the German invasion in 1941, about 200,000 being employed in industry in 1939. Gomel became an important centre for agricultural machinery of all kinds, other industrial products of the country being leather, matches, and paper. Chief agricultural products were potatoes, feeding stuffs, flax, bristles, and horticultural produce. There are also valuable deposits of rock salt; and peat is much worked, making the country virtually self-dependent for fuel. Large areas of marshland were drained, and various waterways were constructed, notably the Dnieper-Bug canal, between 1920 and 1941.

White Russia (sometimes called in English Belorussia) takes its name from the White Russians who inhabit the land. These were one of three Slav groups which migrated from the W., and were differentiated from the Great Russians, who settled farther N., and the Ukrainians, who settled farther S., by language and customs. Their name is said to come from the white felt bonnet and white coat of their traditional costume. White Russian differs so much from Great Russian that it was long considered a separate language. It has basic affinities with Polish, and, as the official language of the Lithuanian duchy afterwards merged in Poland, it underwent considerable external Polish influence also. White Russian was the first Russian idiom to be written, the statute books, documents, and chronicles of the ancient Lithuanian duchy being written in it. In 1519 the Bible was translated into White Russian; but during the same century Polish replaced it as the official and polite speech of the land, and White Russian became a peasant tongue. There are only

a few songs in the White Russian dialect before the 19th century revival when the language was used in poems of literary merit by several writers, notably Jan Czeczot (d. 1847). The White Russians and their language were repressed under the Russian tsars; but on Jan. 1, 1919, White Russia, formed from the earlier govt. of Minsk, proclaimed its independence (i.e. for loss of territory to Poland, and its recovery); the former govts. of Gomel, Vitebsk, and Smolensk were added 1924-26. In German occupation from Aug., 1941; White Russia was not completely liberated until July, 1944. Both agriculture and industry were virtually destroyed in the fighting, towns, villages, and farm buildings being very severely damaged. Restoration was immediately put in hand, and by the end of 1947 more than 6,000 factories of various kinds were working once more.

White's Club. London social club. It is at 37-38, St. James's Street, S.W.1. Founded in 1693 as White's Chocolate House, it was famous as a centre of gallantry and gaming. Destroyed by fire, April 23, 1733, it became a regular club in 1736, under the management of one Arthur (d. 1761), who later founded the club which bears his name. Once famous as a Tory centre, White's is now non-political. See Bow Window.

White Sea (Russ. Bieloye More). Part of the Arctic Ocean. It lies between Cape Kanin, the most N. point of the Kanin peninsula, and the peninsula of Kola or Murmansk. It is 330 m. long, 150 m. wide, and its greatest depth is 700 ft. It contains a few islands, on one of which, Solovetskoi, is a famous convent and place of pilgrimage. There is connexion with the Black and Caspian Seas by canal. The sea is ice-bound from Sept. to June. Salmon, herring, and navaga, a fish allied to the cod, are caught. See Archangel.

White Slave Traffic. Popular term for the criminal practice of procuration (q.v.).

White Spirit. Name given to petroleum distillates intermediate between gasoline and kerosene, with a distillation range of 150°-200° C. They are used as thinners in paints and varnishes and are sometimes sold as turpentine substitute or mineral turpentine. They are also used for dry cleaning. They must be free from corrosive and ill-smelling sulphur compounds, and must not leave oily residues on evaporation. They

are usually refined by acid treatment followed by fresh distillation.

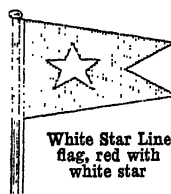
White Star Line. A British steamship company which in 1934 was united with the Cunard Line

to form the Cunard White Star (q.v.). Originally running sailing vessels to Australia, the company was reconstituted by T. H. Ismay in 1871 as the Oceanic Steam Navigation Company. All the ships' names ended in "ic," Majestic and Titanic being famous.

White Sulphur Springs. Watering-place and pleasure resort of W. Virginia, U.S.A., in Greenbrier co. Mineral springs made the place a rendezvous of fashionable health-seekers, and before the Civil War it was a resort comparable in brilliance to Bath. Cottages were built in luxurious style, and in 1854 what was then the largest hotel in the U.S.A. was erected here. After the nearby battle during the Civil War, the ballroom was used as a hospital for the many casualties. After the war the town's great prosperity passed away. White Sulphur Springs is 140 m. S.E. of Charleston, at an alt. of 1,925 ft. in the forested Allegheny mts., on the main line of the Chesapeake and Ohio rly. Pop. 1,484.

Whitethroat. Migratory bird, of which two species occur in Great Britain. The greater whitethroat (*Sylvia communis*) is common everywhere in the country and has reddish-brown plumage on the upper parts, with pinkish-white below. It is generally found in thickets and hedges, and is often known as the nettle creeper. The lesser whitethroat (*S. curruca*) is slightly smaller, and has a grey tinge in its plumage. Rare in England and Scotland, it is absent from Ireland. See Eggs colour plate.

Whitewash. Mixture of whitening, water, and size, used for whitening internal walls and ceilings. Limewashing is covering walls with a mixture of lime and water, and is sometimes included in the term whitewashing. The whitening used in making whitewash is finely powdered white chalk, which should be



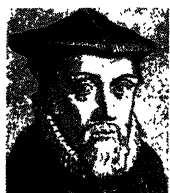
White Star Line flag, red with white star



Whitethroat. The greater species, found in hedgerows

left for about six hours just covered with water. Double size in the proportion of one quart to six pounds of whiting should be added, and the mixture allowed to stand in a cool place until it becomes a jelly. One pound of diluted jelly covers about 6 sq. yds. Many proprietary pastes are sold either ready for use or to be watered down.

Whitgift, JOHN (c. 1530-1604). English prelate. Son of a Grimshy merchant, he passed from S. Anthony's school,



John Whitgift,
English prelate

London, to Cambridge, where he took orders in 1560. He was regius professor of divinity in 1564, helped to draft the university statutes, and in 1570 was vice-chancellor. Bishop of Worcester, 1577-83, he then had 20 years as archbishop of Canterbury, enjoying the favour and support of Elizabeth. Fearless, incorruptible, personally pious, full of reforming zeal, and doctrinally Calvinist, he opposed Puritans and Presbyterians. He erected and endowed a school and almshouses bearing his name at Croydon (q.v.), and died at Lambeth, Feb. 29, 1604. *Consult* Life and Acts, J. Strype, 1822.

Whithorn. Royal and mun. bor. and seaport of Wigtownshire, Scotland. Situated on the Irish Channel, 11 m. S. of Wigtown, it is a branch rly. terminus. Whithorn is one of the most ancient towns in Scotland, having been created a royal burgh by Robert I. The parish church stands on the site of a priory founded by S. Ninian in 397, and the town was the seat of the bishops of Galloway until the Reformation. Of the priory, rebuilt in the 12th century, there are some remains. Pop. 951.

Whiting (*Gadus merlangus*). Fish belonging to the cod family. Very nearly related to the haddock, it may be distinguished by the absence of the chin barbel and of the black patch above the pectoral fin. It usually weighs rather less than 2 lb., and is much in de-



Whiting. British edible fish, valued for the delicacy of its flesh

mand for the table. It occurs in shoals, usually about sandy shores, and feeds chiefly on the fry of other fish. *See* Pout.

Whitley, JOHN HENRY (1866-1935). British politician. Born at Halifax, Feb. 8, 1866, he was educated at Clifton and London university, and entered business in his native town. From 1900 to 1928 he was Liberal M.P. for Halifax. Junior lord of the Treasury and a government whip, 1907-10, he was deputy-Speaker and chairman of committees from 1911 until in 1921 he succeeded Viscount Ullswater as Speaker. He resigned in 1928, when he declined the customary honour of a peerage. In 1930 he became chairman of the B.B.C., holding this position until his death on Feb. 3, 1935. He evolved the Whitley Council (q.v.) for industry.

Whitley Bay. Urban district of Northumberland, England, and a well-known health and pleasure resort. It is on the E. coast, 2 m. N. of the Tyne, with railway stations. Pop. est. 32,000.

Whitley Council. Representative body of the type recommended by the Whitley committee on the relations between employers and employed. This committee was set up in 1916 under J. H.



John H. Whitley,
British politician

Whitley councils, under various names, were widely introduced into industry, local govt., and the civil service. Between the Great Wars the work of Whitley councils and committees in industry was frustrated in several trades by large-scale unemployment. Similar councils, called joint production committees, were introduced during the Second Great War.

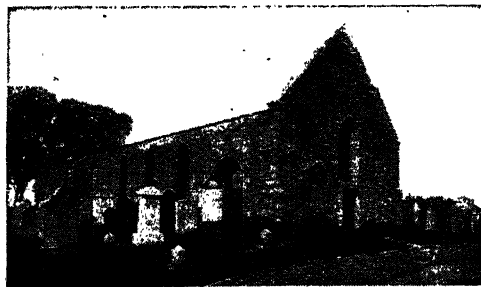
Whitlow. Inflammation and suppurative of the terminal phalanx of the finger, due to infection by any pus-forming micro-organism. It may lead to separation of the nail from its body, and can be most dangerous if the inflammation enters the sheaths of the fingers. Treatment consists in applying hot fomentations of boracic acid and hot soaks of the whole arm, while penicillin and the sulpha group may be helpful. The word is a corruption of quick flaw, i.e. a sore in the quick, the sensitive flesh under the nail.

Whitman, WALT (1819-92). American poet. Of English and Dutch descent, the son of a carpenter, he was born at West Hills, Long Island, May 31, 1819,



Walt Whitman

and after an elementary education worked at carpentry, building, printing, teaching, and journalism. Wandering through much of the U.S.A., he learnt more from fellowship with men and women of all classes than from books, though a student of great literature. He served as an army nurse through the Civil War, wrecking his robust constitution thereby,



Whithorn, Wigtownshire. Ruins of the 12th century priory erected on the site of an older building founded by S. Ninian

Whitley, deputy-Speaker of the house of commons, to explore reasons for and suggest methods of preventing the unofficial strikes that were threatening the war effort. This committee recommended that individual industries should have national joint industrial councils and district councils; and that businesses should establish works committees as a means of consultation between management and employees. Such coun-

then became a clerk in the treasury dept. at Washington. After a paralytic stroke in 1873 he lived in comparative poverty at Camden, N.J., where he died, unmarried, March 26, 1892.

Whitman's chief work, *Leaves of Grass* (q.v.), first appeared as a slender volume in 1855, but the final revised edition, 1881, incorporated most of his poetry. The irregular, unrhymed lines in which most of it is written, in

accordance with the author's belief that the American spirit could not be bound by the shackles of traditional verse-forms, are often uncouth, but have a noble music and cadence of their own.

Contemptuous of tradition, literary, moral, or political, Whitman regarded himself as the prophet of America, which he believed would give the world a free society existing for the mass-production of great personalities. This democracy of the future was to be welded together by the love of comrades (as in *Calamus*), and by equality (*Salutation*, *Song of the Road*). A mystic without a creed, Whitman sees God expressing Himself everywhere—in cities as well as in wild nature. The body is the manifestation of the spirit, which is liberated by death for a higher life. Whitman's meditations on death (*Drum-taps*, *Passage to India*) include some of his greatest work.

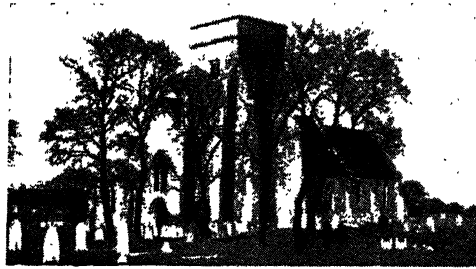
Holding that everything is worthy of celebration in song, Whitman has little sense of relative values. But he has at his best the poetic vision which illuminates the sordid and commonplace, and his robust optimism does not blind him to the uglier aspects of modern society. In his prose work, *Democratic Vistas*, 1871, influenced by Carlyle, he warns America against a soulless materialism. His other important prose work is *Specimen Days and Collect*, 1882.

Of this frank, confident, naïve personality, with an immense capacity for affection, the chaotic and rhapsodical poetry appeals by the breadth and serenity of its outlook, and an emotional tenderness usually manly and wholesome. The extreme lack of reticence in certain poems created a violent prejudice, and the poet of democracy has never been popular, though he has fervent admirers and his indirect influence is great and increasing.

Bibliography. Complete Writings, 1902; Uncollected Poetry and Prose, 1921; Lives, T. Donaldson, 1896; H. B. Binns, 1905; J. Bailey, 1920; H. B. Morris, 1930; N. Arvin, 1938; Critical Studies, J. A. Symonds, 1893; B. de Selincourt, 1914; G. Bullett, 1925; Walt Whitman in England, H. Blodgett, 1934.

Whitney, Mount. The highest peak in the U.S.A., exclusive of Alaska. In the Sierra Nevada (g.v.) range, Calif., it reaches an alt of 14,502 ft.

Whitney, Eli (1765–1825). An American inventor. Born at Westboro, Mass., Dec. 8, 1765, and edu-



Whitstable, Kent. Parish church of All Saints, some distance from the town in the hamlet of Church Street

cated at Yale, he became a teacher in Georgia. He constructed the cotton gin for separating seed from fibre, one of the most important inventions connected with the cotton industry. His first crude machine was stolen, and though Whitney was awarded £10,000 by South Carolina, litigation left him almost penniless. In 1798 he turned his attention to the manufacture of firearms, from which he made a large fortune. He died Jan. 8, 1825. See Cotton.

Whitney, William Dwight (1827–94). American philologist.

Born at Northampton, Mass., Feb. 9, 1827, and educated at Williams College, he studied Sanskrit at Yale, Berlin, and Tübingen, and in 1854 was appointed professor of Sanskrit at Yale.

His most consulted works are *Language and the Study of Language*; *Life and Growth of Language*; *Sanskrit Grammar*; *Oriental and Linguistic Studies*; and editions and translations of various Sanskrit works. He also superintended the publication of the great *Century Dictionary*, and helped to revise Webster's Dictionary. Whitney was the first to lay stress on the importance of analogy in linguistic questions, and held that language originated in the acceptance of conventional terms. He died June 7, 1894.

Whitney Museum. Collection of American art. In W. 8th Street, N.Y.C., it was founded in 1931 by Gertrude Whitney, herself a distinguished sculptor. Its permanent

collection is entirely national, and it pays special attention to contemporary art. It holds annual exhibitions, and publishes books on American art and artists.

Whitstable. Seaside resort and urban dist. of Kent, England. Situated on the

coast 6 m. N. by W. of Canterbury, on the rly., it has a small harbour and carries on a coasting trade; but its fame is due to oyster fisheries. Pop. est. 17,000.

Whitsunday (A.-S., *hwita Sundaeg*, White Sunday). Name given in the English Church calendar to the festival which commemorates the gift of the Holy Ghost to the disciples (Acts 2). Observed in the Christian Church from very early times, it is the Christian Pentecost, as Easter is the Christian Passover, and is regarded as celebrating the ingathering of the first-fruits of the spiritual harvest. The name White Sunday, first used in England about the time of the Norman Conquest, is usually derived from the white garments or chrismos worn on this day by the newly baptized. The tradition that the event celebrated fell upon a Sunday is supported by John 18, v. 28, for if the date of the Crucifixion was the eve of the Passover, Nisan 14, the first of the 50 days and the 50th day were Sundays. In Scotland the name of Whitsunday is given to May 15 each year, that day being one of the legal terms—the other is Martinmas, Nov. 11—at which rent and interest are payable. See Passover; Pentecost; Weeks, Feast of.

Whitten, Wilfred (1864–1942). Name of an English journalist known as John O' London (g.v.).

Whitten-Brown, Sir Arthur (1886–1948). British airman. See Brown, Sir A. W.

Whittier, John Greenleaf (1807–92). American poet. He was born at Haverhill, Mass., Dec. 17, 1807, son of a Quaker farmer, and adhered to his father's creed. Early years were spent on his father's farm, and a first poem appeared in 1826, in *The Free*



Eli Whitney, American inventor After C. B. King



W. Dwight Whitney, American philologist



John Greenleaf Whittier

Press, edited by Garrison. Whittier's earliest work for the anti-slavery movement was done as a journalist. In 1833 he wrote *Justice and Expediency*, an anti-slavery manifesto, and attended at Philadelphia the first meeting of the American Anti-Slavery Society, being on the committee which drafted its declaration of principles. In 1835-36 he represented his district in the state legislature, removing then to Amesbury, where he lived thenceforth, except while editing 1838-40 *The Pennsylvania Freeman* at Philadelphia.

From 1847 Whittier contributed leaders and poems to *The National Era* of Washington, and when *The Atlantic Monthly* was established in 1857 he found a second organ of opinion ready to publish his verses. In 1860 and 1864 he was a member of the Massachusetts electoral college, but with the close of the Civil War and the triumph of the anti-slavery movement he ceased to take any active interest in politics. He died at Hampton Falls, N.H., Sept. 7, 1892. Whittier will be remembered by the fine rhetoric of some of his anti-slavery lyrics, the genuine charm of such ballads as *Maud Muller* and *Barbara Frietchie*, and a vivid picture of New England rural life in *Snow-Bound*. *Consult* *Life* and *Letters*, S. T. Pickard, 1894; *Crusader* and *Prophet*, A. Rowntree, 1946.

Whittington. Parish of Derbyshire, England. Standing on the Rother, 2½ m. N. of Chesterfield, of which it is a district, it has a rly. station. In the parish is the stone cottage called *Revolution House*, where the earls of Devonshire and Danby and John Darcy met in 1688, to arrange the invitation to William of Orange. Iron is worked and steel manufactured. Pop. 11,617.

Whittington, RICHARD (d. 1423). Lord mayor of London. The son of Sir William Whittington, a Gloucestershire knight, he became a mercer with a prosperous business in London. He was lord mayor in 1397-98, 1406-07, and 1419-20. He frequently advanced sums of money to Richard II, Henry IV, and Henry V, and subscribed largely to charities. He died in early March, 1423. The tale of Dick Whittington and his cat dates from the 16th century; the incidents of Dick walking to London, turning back at Highgate, and hearing the bells toll "Turn again, Whittington, lord mayor of London," have been worked up into one of the most familiar pantomimes. *Consult* *Life*, Sir W. Besant.

1881; *Talking* of D. W., H. Pearson and H. Kingsmill, 1947.

Whittle, SIR FRANK (b. 1907). British airman and inventor. Born at Leamington, June 1, 1907, he



Sir Frank Whittle, British airman and inventor

enlisted in the R.A.F. as a boy apprentice in 1923, and gained a cadetship at Cranwell college, where he first conceived the idea of applying jet propulsion to aircraft. Whilst developing his invention he served with fighter squadrons, but in 1936 was attached to the special duties list. His first engine ran successfully in 1937, and was installed in an operational aircraft in 1941. Whittle, an M.A. of Cambridge, was knighted in 1948 and awarded a govt. grant of £100,000. He retired with the rank of air commodore, and joined B.O.A.C. as technical adviser.

Whittlesea or **WHITTLESEY**. Market town and urban dist. of the Isle of Ely, Cambs, England. It is 5 m. by rly. E. of Peterborough. There are two old churches, dedicated to S. Andrew and S. Mary. The land all around is drained by artificial channels. Pop. approx. 8,800.

Whitty, DAME MAY (1865-1948). British actress. Born in Liverpool, June 19, 1865, she went on the stage there in 1881, making her London debut next year in *Boccaccio*, at the Comedy Theatre. She joined Irving in 1895, appearing in *The Lyons Mail*, *The Corsican Brothers*, and other Lyceum melodramas. She created the part of Susan in *Quality Street*, 1903.

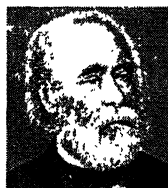


Richard Whittington, three times lord mayor of London
From an engraving by Elstracke. c. 1620

and did notable work in plays by Granville-Barker and Pinero. After the First Great War she went in more for comedy, e.g. *The Last of Mrs Cheyney*; but *Night Must Fall*, 1935, gave her one of the best parts in her career. She went to Hollywood for a screen version of that play, and was in the British film *The Lady Vanishes*, 1938. Created D.B.E., 1918, and married to the actor Ben Webster (q.v.) since 1892, she died in Hollywood, May 29, 1948.

Whitworth. Urban dist. and parish of Lancs, England. It is 3 m. N. of Rochdale, with a station on the rly. Principal industries: mining and quarrying. Pop. 8,360.

Whitworth, SIR JOSEPH (1803-87). British engineer. Born Dec. 21, 1803, at Stockport, he set up in



Sir J. Whitworth, British engineer

Manchester in 1833 as a tool maker. He invented many improvements in the manufacture of machine tools, and by micrometric methods obtained absolutely plane metal surfaces which made him famous. He standardised the measurements of screw threads and gauges, one of the greatest steps in mechanical progress. In 1854 he was asked by the government to design machinery for the manufacture of small arms, but, his rifle being rejected, he turned his attention to the manufacture of cannon, in which he effected a great advance by using cast steel. In 1869 Whitworth was made a baronet and awarded the Albert medal of the Society of Arts. He endowed 30 scholarships in mechanics, and left nearly £600,000 for education and charitable purposes on his death, Jan. 22, 1887. The engineering firm he founded in Manchester was amalgamated in 1897 with that of Sir William Armstrong (q.v.) at Elswick.

Whooping-cough or **PER-TUSSIS**. Acute infectious disease characterised by catarrh of the air-passages and a spasmodic cough or "whoop." The organism responsible has not been identified with certainty. Transmission of whooping-cough from person to person is most often due to direct droplet infection. Infants and children are specially liable to attack, but adults and old people sometimes suffer from the disease in severe form. The early symptoms are those of an ordinary cold.

In about a fortnight begins the characteristic "whoop" caused by excitability of the mucous membrane and disturbance of the vagus nerve. Bleeding from the nose is common, and small blood vessels in the skin may be ruptured. This stage may continue for four weeks up to three months, the whoop gradually disappearing and the paroxysms of coughing occurring at longer intervals.

Medical treatment is limited to relieving the severity of the cough by sedative drugs, and guarding against loss of weight by giving frequent small meals. The room should be warm but well ventilated. Whooping-cough is rarely fatal among children who are well looked after, but among the poorer classes in large towns it is responsible for the death of many infants under one year of age, owing to the development of bronchitis or broncho-pneumonia. Prophylactic injection against whooping-cough has been combined with that against diphtheria.

Whorl or **VERTICIL**. In botany, a cluster of leaves or flowers that grow in a circle around the stem. Plants of the family Labiatae are examples of this method of growth. The term is also used in zoology to describe the volutions of the spire of a univalve shell.

Whortleberry. See **Bilberry**.

Who's Who. British annual publication. It first appeared on March 21, 1844, being founded by Alfred Baily (1808-84), who, with his brother Charles (1821-92), had a publisher's business at Royal Exchange Buildings, London. It gives details, provided by the subjects, of the lives of notable living persons, arranged in alphabetical order. Douglas Sladen planned a new form as editor 1897-99. The publishers are A. & C. Black, Ltd.

Whyalla. Industrial centre in S. Australia. On the W. shore of Spencer Gulf, it is a rly. terminus 145 m. direct N.W. of Adelaide. At the end of a pipe-line, it has blast furnaces, iron and steel works, and shipyards, industries established by the Broken Hill mining co. In 30 years Whyalla has grown from a small sheep station to a well-planned town of 8,000 pop.

Whydah, **WHIDAH**, **QUIDAH**, or **WIDA**. Seaport of Dahomé, French W. Africa. Connected by rly. with Kotonu, about 100 m. to the E., it is the administrative h.q. of a dist. of the same name.

Whymper, **EDWARD** (1840-1911). British mountaineer. Born in London, April 27, 1840, and trained as a wood-engraver, he

went in 1860 to the Alps to make sketches of mountain scenery. There he gained a reputation as an

intrepid mountaineer, and on July 14, 1865, was the first to reach the summit of the Matterhorn. In visits to Greenland, 1867 and 1872, he made valuable collections of fossils, doing the same during his visit to the Andes of Ecuador, 1879-80, when also he made two ascents of Chimborazo. His last expedition of note was to the mountains of the Great Divide, Canada, 1901-05. Whymper published his travels, with his own illustrations, in *Scrambles Among the Alps*, 1871; *Travels Among the Great Andes of the Equator*, 1892; *Chamonix and Mont Blanc*, 1896; *Zermatt and the Matterhorn*, 1897. He died Sept. 16, 1911. Robert Douglas played Whymper in a film, *The Challenge*, 1938.

Whyte, **ALEXANDER** (1837-1921). Scottish divine and author. Born at Kirriemuir, Jan. 13, 1837, the son of a shoemaker, he worked as a hand-loom weaver, became a teacher, and in 1858 entered Aberdeen university, graduating in 1862. He studied for the Free Church ministry at New College, Edinburgh, and became minister at Free S. John's, Glasgow, in 1866. He removed to Free S. George's, Edinburgh, in 1870, and after three years was sole minister. Principal of New College from 1909, he resigned in 1918. He wrote biography and criticism: *Commentary on the Shorter Catechism*, 1882; *The Apostle Paul*, 1903; *The Walk, Conversation, and Character of Jesus Christ*, 1905; *Bunyan Characters* (4 vols.), 1894; *Bible Characters* (6 vols.), 1897. He died at Hampstead, Jan. 6, 1921.

His eldest son, Sir (Alexander) Frederick Whyte (b. Sept. 30, 1883), was Liberal M.P. for Perth, 1910-18, and president of the Indian legislative assembly 1920-25, being knighted 1922.

Whyte-Melville, **GEORGE JOHN** (1821-78). British novelist. Born in Fife. June 19, 1821, and edu-

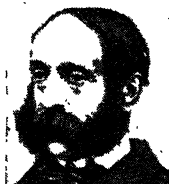
cated at Eton, he entered the Coldstream Guards, retiring with the rank of major in 1849. In the Crimean War he was an officer in the Turkish cavalry. At his home at Tetbury, Glos, he gave full rein to his predilection for field sports, and wrote many novels dealing largely with the hunting-field and country life, or of historical romance. Among the best-known are *Digby Grand*, 1853; *Holmby House*, 1860; *Market Harborough*, 1861; and *The Gladiators*, 1863. The proceeds of the extensive sales he devoted to philanthropic objects. He met his death from a fall in the hunting-field, Dec. 5, 1878.

Wichita or **BIG WICHITA**. A river of Texas, U.S.A. Rising in the N. part of the state, it flows 235 m. E. to join the Red river. The Little Wichita, flowing N.E., is also an affluent of the Red river.

Wichita. Second largest city of Kansas, U.S.A., the co. seat of Sedgwick co. It stands on the Arkansas river, 210 m. by rly. S.W. of Kansas City, and is served by the Atchison, Topeka, and Santa Fé and other rlys. It is the seat of the Friends' university. In Riverside Park, 145 acres are zoological gardens. Wichita ranks fourth as a national milling centre. Its refineries turn out daily 11,000 barrels of petroleum. Other industrial plants are large packing establishments, stockyards, foundries and machine shops, and motor vehicle works. Wichita was settled in 1870 and chartered as a city next year. Pop. 114,966.

Wick (A.S., *weoca*, weak, pliant). Originally the pith of a rush placed through a candle. Wicks are now pieces of twisted or woven fabric, generally cotton, used in lamps and automatic lighters to lead oil or spirit to the flame. Candle and lighter wicks are usually round, and lamp wicks flat. They act by capillary attraction, drawing oil or other fuel from the reservoir; when the fuel comes in contact with the air it forms a gas, and so maintains combustion. Cellulose and glass wool wicks are also used.

Wick. Royal and parl. burgh, seaport, and county town of Caithness, Scotland. One of the chief centres of the Scottish herring fishery, it is situated on the E. coast, 20 m. S.E. of Thurso, with



G. J. Whyte-Melville,
British novelist



Edward Whymper,
British traveller



Alexander Whyte,
Scottish divine

a station on the rly. The town consists of two dists., Wick and Pulteneytown, the first being on



Wick arms

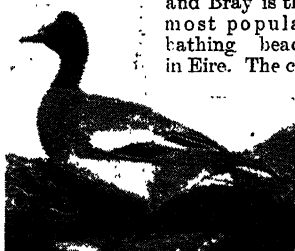
the N. side of the bay. The chief buildings are churches and the town and county buildings. A harbour, in two parts, is accessible at all tides, and in the herring season, when the workers come in from the neighbouring district to gut and cure the fish. Wick is one of the busiest fishing ports of Great Britain. There is some shipbuilding, and the town does considerable trade in cattle. In the vicinity are the ruins of Wick Castle, known as the Old Man of Wick, a landmark for passing vessels. Pop. 7,200.

Wicken Fen. Nature reserve in Cambridgeshire, England. Six hundred acres in area, it was acquired in 1928 by the National Trust, which has preserved its natural flora and fauna for the benefits of students and others. Access is by permission only. The village of Wicken is 7 m. S.S.E. of Ely, and has a fine old church.

Wickham, ANNA. Pen-name of Edith Alice Mary Hepburn (1883-1947). English poet. Born at Sutton, Surrey, her maiden name being Harper, she was taken to Australia as a child and educated at Sydney high school. She returned to England and studied under Jean de Reszke, intending to take up a musical career. This was abandoned on marriage, and she began to write verse shortly before the First Great War. Harold Munro (*g.v.*) recognized her ability and published her first book, *The Contemplative Quarry*, in 1917, followed by *The Little Old House* in 1921. A selection of her later poems, ed. J. Galsworthy, appeared in 1936. Anna Wickham died May 1, 1947. Although her published output was small, she had a highly individual talent for brief, delicate lyrics, which owed nothing to any fashionable school of poetry.

Wicklow. Eastern maritime county of Eire. In the prov. of Leinster, it has some 36 m. of coastline, often obstructed by sandbanks; and its deep glens, valleys, and lakes have won for it the name of the garden of Ireland. From N.E. to S.W., the interior is traversed by the Wicklow Mts. (Lugnaquilla, 3,039 ft.). The chief rivers are the Liffey, Slaney, Avoca, and Vartry. Lead, copper, and other

minerals are worked, and there are valuable granite quarries. The Eire state rlys. serve the co., in which are the picturesque vales of Glendalough and Avoca. Oats and potatoes are the principal crops, while sheep, cattle, pigs, and poultry are reared. Easy accessibility from Dublin makes Wicklow usually the first county visited by tourists. Enniskerry and Glendalough are favourite holiday spots,



Widgeon. Male bird of a species of British wild duck

and Bray is the most popular bathing beach in Eire. The co.

returns three members to the Dáil. Area 782 sq. m. Pop. 60,340.

Wicklow was not made a county until 1606, for though the foothills of the mts. reach the outskirts of modern Dublin, the Irish in the mts. themselves held out longest against the English. They eventually surrendered to Cromwell without striking a blow. Black Castle was founded by the Norman invaders, but retaken by the Irish in 1301, later becoming the stronghold of the O'Tooles. The beautiful 18th century mansion of Lord Powerscourt near Enniskerry occupies the site of a fortress built by De la Poer, one of the knights who landed with Strongbow.

Wicklow. Co. town and seaside resort of Wicklow, Eire. It is situated on a hillside overlooking the mouth of the Vartry river, 28½ m. S.S.E. of Dublin. The earliest church was founded by S. Mantain, a contemporary of S. Patrick, whence the Irish name of Cill-Mantain. There are chemical works, and grain is exported. The harbour can accommodate vessels of 1,500 tons. Pop. 3,027.

Wideawake or **SOOTY TERN** (*Sterna fuliginosa*). Bird of tropical and sub-tropical seas. Its upper parts are black; face, breast, and under parts white; bill and feet black. See Ascension; Tern.

Widcombe - in - the - Moor. Village of Devon, England. It is 5 m. W.N.W. of Ashburton, on the slopes of Rippon Tor and the E. border of Dartmoor. Its fair, held on the second Tues. of Sept., has been immortalised in the ballad *Widcombe Fair*, which gave a

title to one of the most popular novels of Eden Phillpotts. At the church of S. Pancras, known locally as the cathedral of the moor, there was an occurrence believed unique on Oct. 21, 1638, when the building was struck by lightning during service and a ball of fire passed up the aisle, killing four people. Pop. 673.

Widgeon (*Anas penelope*). British wild duck. It is about 18 ins. long: and the plumage is white on the forehead, chestnut speckled with green on the cheeks and neck, greyish on the back, brown on the wings and tail, and grey beneath: the beak is blue. It occurs in winter about the shores and on inland waters, and breeds in a few localities in Scotland and Ireland.

Widin. Variant spelling of the name of the Bulgarian town entered in this Encyclopedia as Vidin.

Widmanstätten Structure. A term used in metallography to describe the microstructure obtained in some alloys when a phase is precipitated as needles or plates along crystallographic planes of a parent phase. Alois de Widmanstätten first observed the structure



Widmanstätten Structure. See text

in nickeliferous iron meteorites in 1808. The accompanying photomicrograph of a copper-base alloy shows grain boundary and Widmanstätten precipitation of a light etching phase from a dark etching phase matrix.

Widnes. Mun. bor. of Lancs, England. Situated on the N. bank of the Mersey, 12 m. S.E. of Liverpool, it is served by rlys. and connected with *Runcorn* (*g.v.*) by a transporter bridge across the river, and by the ship canal. The principal trade is



Widnes arms

in chemicals, the town being one of the chief producers of alkali in Great Britain. There are also foundries and copper-smelting, asbestos, cement, and timber works. Pop. est. 45,000.

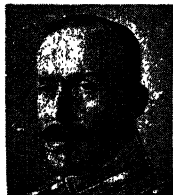
Widor, CHARLES MARIE JEAN ALBERT (1845-1937). French composer. Born at Lyons, Feb. 22,

1845, he became organist at S. Sulpice in Paris in 1870, and 20 years later professor of the organ and of composition at the Paris conservatoire. He lived until March 12, 1937. Well-known as a music critic, he composed songs, symphonies, concertos, and piano pieces; ballets such as *La Korrigane*, 1880; and operas, of which *Les Pêcheurs de Saint Jean*, 1905, may be mentioned. But his fame rests on ten symphonies for the organ, in which the instrument is treated orchestrally.

Widow. Woman whose marriage has been terminated by the death of her husband. In England a widow whose husband died intestate is entitled to £1,000 out of his estate, all his furniture and other personal chattels, and in addition, if there are no children of the marriage, to a life interest in the rest of his property, and if there are children, to a life interest in half of it. If a widow considers that her husband's will does not make reasonable provision for her maintenance she may under the Inheritance (Family Provisions) Act of 1938 apply to the court for such provision.

Widsith (A.-S., far traveller). Anglo-Saxon poem preserved in the *Exeter Book* (q.v.). It is the narration by a scóp or gleeman of his wanderings in many parts of Europe, and of the rulers he met, and probably comprises a very early poem with later additions. A translation of it is given in *Morley's English Writers*, 1864-67.

Wied. Name of a German family. It takes its name from the county of Wied, a district on the Rhineland around Neuwied. The counts appeared about the 10th century and ruled their territory until the changes of the French Revolution. In 1784



William of Wied,
German prince

they were given the title of prince, and they continued to reside at Neuwied, which town was founded by one of them. Elizabeth, queen of Rumania, was of this family. After the Balkan Wars, when the European powers decided to give Albania a ruler, its crown was offered to her nephew Prince William of Wied (b. March 26, 1876). Taking the title of impet (mutilation of *imperator*), he reigned March 7-Sept. 5, 1914, the outbreak of the First Great

War putting an end to his rule. With his children he adopted Rumanian nationality in 1934.

Wieland, CHRISTOPH MARTIN (1733-1813). German poet. Born Sept. 5, 1733, at Oberholzhelm, Württemberg, he studied law at Tübingen, but on visiting the learned Bodmer at Zürich in 1752, decided to devote himself to literary work. In 1760 he returned to Biberach. Wieland translated 22 plays of Shakespeare into German, 1762-66, not very successfully, but it was the first time the task had been attempted. Then he wrote *Agathon*, 1766-67, in which he presented much of his own story; it was the first novel in which he showed himself markedly under French influence. Stories and poems followed with amazing rapidity. In 1769 he became a professor at Erfurt, and three years later tutor to the sons of the grand duchess of Saxe-Weimar, at Weimar, where he passed much of the rest of his life, and died Jan. 20, 1813.



Christoph Wieland,
German poet

Wieland was the first of the literary group that was to render that city famous; there he started *Der deutsche Merkur* (The German Mercury), 1773, a literary periodical which had considerable influence; there he became the friend of Goethe and Herder; there, besides many further stories and poems, German renderings of Cicero, Horace, and other classics, he wrote his best-known work, the epic *Oberon*, 1780, based upon the old French romance of Huon of Bordeaux, and translated into English by W. Sotheby, 1798.

Wieland, HEINRICH (b. 1877). German chemist. He was born June 4, 1877, at Pforzheim, son of a chemist, and educated there and at Munich, Berlin, and Stuttgart where he gained his Ph.D. in 1901. At Munich he was assistant professor from 1913 and simultaneously director of the organic dept. of the state chemical laboratory. In 1917 he moved to the technical university; in 1921 was at the laboratory of Freiburg; in 1925 came back to Munich as successor to Willstätter. Research work on biological oxidation, which Wieland believed to be a process of dehydration, brought him the Nobel prize for chemistry in 1927 and membership of Washington and Boston academies, and in 1931

of the Royal Society. He became editor of the *Liebig Annals*. In 1948 he resigned his chair when the Bavarian authorities made known their proposal to reorganize their laboratories.

Wieliczka. Salt mines of Poland, in Galicia, 8½ m. S.E. of Cracow, with which there is rly. connexion. There are 78 m. of passages and several chambers, some being chapels with altars and statuary, the whole carved from the rock salt.

Wien. Native name for the Austrian capital, known to the English as Vienna (q.v.).

Wien, WILHELM (1864-1928). German physicist, born at Gaffken, E. Prussia, Jan. 13, 1864. In 1890 he was appointed assistant to Helmholtz at the physico-technical institute. Subsequently he held research posts at Giessen, Würzburg, and Munich, investigating various problems connected with optics, and propounding new theories of radiation. Particularly notable was a treatise on black-body radiation, for which he received the Nobel prize for physics in 1911. He died Aug. 30, 1928. *Pron. Veen.*

Wiener Neustadt. Town of Austria, in the prov. of Lower Austria, 30 m. by rly. S. of Vienna. The famous 12th century castle of the Babenbergs was after 1752 a military academy. The town hall housed an interesting collection of antiquities. Pop. 28,789.

A rly. junction, Wiener Neustadt was made by the Germans into an industrial centre with locomotive and small arms factories, and a Messerschmitt works estimated in 1943 to be producing 400 fighters a month (a third of all German production). It was therefore the object of a number of Allied air attacks, beginning with the first raid on Austria by British or U.S. planes on Aug. 13, 1943, when U.S. bombers from N. Africa made a daylight attack on the aeroplane works; they met on this occasion only slight opposition, in what had been considered by the Germans a safe area. Later raids met much better defence. Wiener Neustadt was occupied by Marshal Tolbukhin's 3rd Ukrainian army, April 3, 1945, and after Germany's surrender came within the Russian zone of occupation in Austria.

Wieniawski, HENRI (1835-80). Polish violinist. Born at Lublin, July 10, 1835, he studied in Paris, 1845-46, gave recitals in St. Petersburg, 1848, spent another year of study in Paris, and began his successful career as a virtuoso.

touring Europe with his brother Joseph (1837-1912), a distinguished pianist. Henri taught in St. Petersburg, 1862-67, toured the U.S.A., and was professor of the violin at Brussels conservatoire, 1874-77. Despite bad health he continued to tour until his death in Moscow, March 31, 1880. He left several compositions of merit, especially two violin concertos.



Wiesbaden, Germany. The new Kurhaus and gardens

Wieringen. Town of the Netherlands, in the N.E. of the prov. of N. Holland. Formerly an island in the Zuider Zee, it was joined to the mainland by a barrage 1½ m. long, completed 1925, as the first step in the draining of that sea. The Wieringermeer polder was drained by 1930 and the barrage between Wieringen and Friesland, 18½ m. long, was completed in 1933. The new fields were inundated and many of the new farm houses in the area destroyed, when the Germans cut the dyke between the polder and the Yssel Meer in 1945. The breaches were repaired, the water pumped out, and restoration put in hand the same year; damage to fields was much less than had been feared, as the waters of the Yssel Meer were, by 1945, merely brackish, and not, like those which inundated Walcheren (*q.v.*) salt sea water. Wieringen has a fishing industry, and has become a trade centre of agricultural produce. Pop. 5,465. See illus. p. 6023.

Wiertz, Antoine Joseph (1806-65). Belgian painter. Born at Dinant, Feb. 22, 1806, he studied at Antwerp under Herreyens and Van Bru, and in Rome. The foundation of his art was a morbid mysticism, which in later years grew upon him to the exclusion of aesthetic beauty. He lived and



Antoine Wiertz,
Belgian painter
Self-portrait

died in Brussels. After his death, June 18, 1865, his house was converted into a museum of his works.

Wiesbaden. Town and spa of W. Germany, capital of the Land of Hesse. Situated in hilly surroundings, with its S. suburb Biebrich on the Rhine, 18 m. W. of Frankfurt, it used to attract 100,000 guests a year, one-fifth of them from abroad. The cure prescribed for rheumatic and similar diseases and nervous and bronchial ailments was based on 27 hot saline springs greatly aided by a pleasant climate and luxurious hotels, sanatoria, and parks. A large Kurhaus, theatre, opera house, several palaces, museums, churches, libraries, and other

public buildings (mostly modern) made Wiesbaden one of the most beautiful towns of Germany. It was founded by the Romans, of whose 3rd century fortress and famous saline baths the ruins are preserved; its name then was Aquae Mattiacae. In the 12th century it came to the Nassau dynasty, and was again a spa from 1322. Destroyed in the Thirty Years' War, 1644, it was rebuilt and again made the capital of Nassau until the duchy was annexed by Prussia in 1866. William II liked Wiesbaden as a residence. The town was under occupation by the French from 1918 to 1930. Gen. Patton's U.S. 3rd army captured it March 28, 1945; after the surrender of Germany it came within the U.S. zone of occupation. A fine palace with huge park stands near the Rhine at Biebrich. Pop. 204,170.

Wig (shortened form of *periwig*, from Fr. *perruque*). Artificial head of hair. In ancient Egypt, elaborate wigs, of which examples are preserved, were used by kings, officials, and women. They were worn by Persians, Greeks, and Romans, and were commonly used by actors. Roman ladies wore wigs of yellow hair brought from Germany. Gentlemen's wigs became popular in France under Louis XIII, who wore them to conceal his baldness. Under Louis XIV they were im-



Wig. Principal fashions in men's wigs. 1. Full-bottomed, 17th century. 2. Early Georgian, c. 1730. 3. Bob wig, c. 1750. 4. Clerical wig, c. 1830. 5. English judge's and, 6. barrister's wigs

mense, flowing over the shoulders in curls tied with ribbons. In England after 1660 they gradually became general among gentlemen. The full-bottomed wig was replaced by the smaller peruke or tie-wig, originally used in travelling and campaigning. In the latter half of the 18th century the custom of wearing wigs was slowly superseded by that of powdering the natural hair, professional men being the last to abandon the wig. In England the Speaker of the house of commons and judges wear full-bottomed wigs; barristers wear tie-wigs. Small wigs of natural hair remain in use; and the toupee and scalpette conceal partial baldness.

Wigan. County borough and market town of Lancashire, England. Standing on the Douglas, 18 m. W.N.W. of Manchester, and served by rly., it is the centre of a rich coalfield, and an important manufacturing town. Over 100 industries are concerned principally with mining, engineering, clothes, footwear, bricks, pipes, timber, oil, and brewing. All Saints is a 14th century church, there is an old grammar school, and the town hall was built in 1866. In the Civil Wars Wigan was prominent, and it saw a rising in favour of Charles II, repressed by Lüburne, 1651. It was also con-



Wiesbaden arms



Wigan arms



Wigan, Lancashire. Parish church of All Saints

cerned in the Jacobite risings. It sends one member to parliament. Market day, Fri. Pop. 85,357.

Wiggin, KATE DOUGLAS (1856-1923). American author, whose maiden name was Smith. Born in



Kate Douglas Wiggin, American author

Philadelphia, Sept. 28, 1856, she graduated at Abbott academy, Mass., in 1878. She brought out many successful novels, the most popular of which have been Rebecca of Sunnybrook Farm, 1903 (filmed 1932), and Penelope's Experiences in England, Scotland, and Ireland, 1898-1901. She died Aug. 24, 1923, and next year appeared her reminiscences, My Garden of Memory.

Wight, ISLE OF. Island off the S. coast of England. Separated from the mainland by the Solent and Spithead, it is 23 m. from E. to

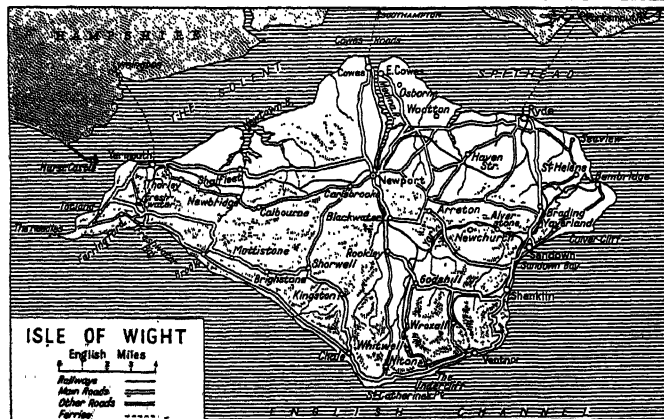
W., and 13 m. from N. to S. Its area is 147 sq. m. It is included in the geographical county of Hampshire, but is separately administered. Newport is the capital. The island is noted for its mild climate, and all round the coast are watering-places, e.g. Shanklin, Sandown, Ventnor, Ryde, Cowes, and Freshwater.

Stretching W. from Ventnor is the Undercliff. Chines, ravines running into the land, add to the beauty of the coast. Chalk downs traverse the island from E. to W., culminating in St. Boniface Down, 785 ft. alt., and ending in Culver Cliff (E.), and the Needles (W.). Parkhurst is a small forest in the N. The chief rivers are the two Yars and the Medina.

The island, the ancient Vectis, is rich in antiquities, having been in-

habited in turn by Romans, Jutes, and Danes. At Brading is a fine Roman villa, and Roman remains have been found at Carisbrooke and elsewhere. Carisbrooke is noted for its castle. At Quarr Abbey are remains of a Benedictine house. Bonchurch and Shalfleet have Norman churches. Other edifices are Osborne House, once the residence of Queen Victoria; Farringford, where Tennyson lived; and Brook House.

Several rlys. converge on Newport. A service of steamers is maintained between Portsmouth and Ryde, Southampton and Cowes, and Lymington and Yarmouth. The island sends one member to parliament, and is divided into two hundreds, E. and W. Medina, that river separating them. It is in the diocese of Winchester. Apart from catering for visitors, agriculture is the chief industry, the island having certain peculiar customs; and there is some fishing. The whole island was a prohibited military area 1940-45. It is protected by forts which guard the entrance to the Solent. Pop. 88,454. See Carisbrooke; Cowes; Hampshire;



Isle of Wight. Map of the island off the coast of Hampshire. Upper picture, an infra-red air view of the island; the Solent is on the left and St. Catherine's Point on the extreme right. The point projecting to the right foreground is the Needles

Osborne House. Consult England's Eden, E. Burton, 1946; Isle of Wight, A. de Selincourt, 1946.

Wightman Cup. Trophy at lawn tennis competed for annually by women amateurs representing England and the U.S.A. Mrs. Wightman played for the latter when the cup was first awarded in 1923 and held by the U.S.A. without the loss of a match. England was successful only in 1924-25-28-30, the fixtures continuing until 1939 and being revived after the Second Great War. The complete event consists of five singles and two doubles matches.

Wigmore. Village and parish of Herefordshire, England. It is 8 m. S.W. of Ludlow, and contains the ruins of a 12-14th century castle and the vestiges of an Augustinian priory founded by the

Mortimer family. The church has a Norman nave. Beautifully situated just S. is the partly black and white Wigmore Hall, dating from the 16th century.

Wigram, CLIVE WIGRAM, 1ST BARON (b. 1873). Private secretary to George V of England. He was educated at Winchester, and was commissioned in the R.A. at 20, becoming A.D.C. to Lord Elgin, then viceroy of India, two years later, and acting in a similar capacity to Curzon during 1899-1904. Military secretary to the G.O.C., Aldershot Command, 1908-10, he became assistant private secretary and equerry to the king in 1910, holding this position until 1931, when he became private secretary and later keeper of the privy purse. He was also deputy constable of Windsor Castle and keeper of the king's archives. In 1936 King George VI appointed Wigram a permanent

ficant under David II. A prehistoric stone circle is the legendary tomb of King Galdus. Pop. 1,261.

Wigtownshire or WIGTOWNSHIRE. County of Scotland. With an area of 487½ sq. m., it lies in the extreme S.W., forming part of the district of Galloway. The coast is deeply indented by Loch Ryan, Luce Bay, and Wigtown Bay. A double peninsula on the



Wigtownshire county arms

W. is known as the Rhinns of Galloway; the S.E. projection as the Machers or Machars; and the stony infertile upper district as the Moors. The coast is bold and rocky, the chief headlands being Corsewall Point, the Mull of Galloway, and Burrow Head. Towards the Ayrshire border, heights approach 1,000 ft. The chief rivers are the Cree, dividing the co. from Kirkcudbright, the Bladnoch, and the Luce.

Industries include rearing sheep, cattle, pigs, and horses, and growing oats and other crops; dairy farming is also carried on. Wigtown is the county town, other places being Portpatrick, Stranraer, and Newton Stewart. At Whithorn, S.

Ninian brought Christianity to Scotland in 397. Wigtownshire was part of the kingdom or lordship of Galloway before it was made a shire of Scotland in the 13th century, and there are many ancient fortresses. Pop. est. 31,800. See Galloway.

Wigwam (Micmac, dwelling). Name in popular use for various types of American Indian dwelling. It denotes primarily the permanent Algonquian hut, conical or beehive-shaped, formed of converging saplings and bark-covered. See American Indians.

Wilberforce, SAMUEL (1805-73). British prelate. Born at Clapham, Sept. 7, 1805, he was a son of William Wilberforce. Educated at Oriel College, Oxford, he was ordained in 1828. In 1830 he was made rector of Brighthelm, I.O.W., and in 1840 of Alverstoke. Next year he was chaplain to the prince

consort, and in 1845 was chosen bishop of Oxford. In 1869 he was translated to Winchester, and he died, the result of a fall from his



Samuel Wilberforce, British prelate

horse near Dorking, July 19, 1873. A speaker of great eloquence and remarkable for his ready wit, of which many stories are told, he excelled in reconciling, or attempting to reconcile, men of diverse opinions, hence his nickname of Soapy Sam. His energy was marvellous, and to it the Church of England owes a great deal. He published, in collaboration with his brother, the standard life of his father. One of his three sons, Ernest Roland (1840-1907), became bishop of Newcastle; another, Albert Basil Orme (1841-1916), became canon and archdeacon of Westminster. Consult Life and Selections from his Diary, A. R. Ashwell and R. G. Wilberforce, rev. ed. 1888.

Wilberforce, WILLIAM (1759-1833). British reformer. Born at Hull, Aug. 24, 1759, he was educated at Pocklington and S. John's College, Cambridge. He became M.P. for Hull in 1780, and was soon prominent both in society and in the House.

In 1784 he was returned as M.P. for Yorkshire. Wilberforce came forward as a practical Christian, and in 1788 threw his whole energy into the cause of liberating



After Sir T. Lawrence



Wigtownshire. Map of the extreme south-western county of Scotland, forming part of the district of Galloway

lord-in-waiting. Knighted in 1928, he was made a baron in 1935.

Wigston. Urban dist. and parish of Leics, England. It is 4 m. S. of Leicester, and is a junction on the rly. From its two parish churches of S. Wolstan and All Saints it is sometimes called Wigston Two Steeples. Pop. 14,530.

Wigton. Market town of Cumberland, England. It is 12 m. S.W. of Carlisle, being connected therewith by rly. and bus. There is a clothing factory, and another making transparent wrapping, while the town is an agricultural centre. Market day, Tues. Pop. 4,000.

Wigtown. Royal and mun. burgh, seaport, and co. town of Wigtownshire, Scotland. Situated on Wigtown Bay, 8 m. S. of Newton Stewart, it is served by rly. An ancient town which arose round the Saxon castle, it became signi-



Wigwam. Bark-covered dwelling of the Blackfoot Indians, in the Glacier National Park, Montana

the slaves. With Clarkson and others he carried on a vigorous agitation; he gained the support of his friend Pitt, and saw some of the fruit of his labours in the Act of 1807 which ended the slave trade. Besides abolitionist speeches, Wilberforce in 1823 drew up an appeal to the religion, justice, and humanity of the British Empire on behalf of West Indian negroes; and the bill to emancipate them completely passed its second reading a few days before his death. M.P. for Bramber, 1812-25, he died July 29, 1833. *See* Slavery; Slave Trade.

Bibliography. Life, R. I. and S. Wilberforce, 1838; Correspondence, ed. R. I. and S. Wilberforce, 1840; Lawn Sleeves, J. C. Hardwick, 1933; Wilberforce, R. Coupland, new ed. 1945.

Wilcox, ELLA WHEELER (1855-1919). American versifier, whose maiden name was Wheeler. With



Ella Wheeler Wilcox,
American poet
Haines

a talent for writing the acceptable commonplace, she contributed verses to American magazines from the age of 7. Her output was enormous, and her volumes were extremely popular in Great Britain no less than in the U.S.A. She died at Shortbeach, Conn., Oct. 30, 1919.

Wild, SIR ERNEST EDWARD (1869-1934). English lawyer. Born Jan. 1, 1869, at Norwich, he was educated there

and at Jesus College, Cambridge. In 1893 he became a barrister and built up a reputation as an advocate, especially in criminal cases. He was returned in 1918 as Unionist M.P. for Upton, West Ham, and in 1921-22 actively supported the Coalition government. Made K.C. in 1912, he was knighted in 1918. In 1922 he was appointed recorder of London, a post he held until his death, Sept. 13, 1934. He was a firm supporter of the Discharged Prisoners' Aid Society. A Life, by R. J. Blackham, came out in 1935.

Wild, JONATHAN (d. 1725). An English criminal, born at Wolverhampton. He became one of the most notorious receivers of stolen

goods in London, and ruthlessly blackmailed all who came to him. He organized one of the largest bands of

thieves, pickpockets, and burglars ever known. A riot which he provoked was the beginning of his downfall. He was found guilty of being concerned in stealing lace, sentenced to death, and hanged at Tyburn, May 24, 1725. Fielding wrote a satire, *History of the Life of the Late Mr. Jonathan Wild*, 1743.

Wildcat. An oil well drilled at random. Since petroleum can be detected only by drilling, all oil discoveries are by chance, but the risk is reduced if geological principles guide the siting of the boreholes. Drilling depths and costs continually increase, and the wildcat therefore is becoming rarer; but since oil is sometimes found in unexpected places, and the reward for its discovery may be great, wildcat drillings are likely to continue to be made.

Wild Duck, THE. Tragedy by Ibsen. Written in 1884, it belongs to his middle playwriting period, and has been described as burlesquing the Ibsenites; for after being acclaimed as a crusader against shams, Ibsen now appears to satirise misdirected idealism in the person of Gregers Werle, who wishes to right his father's wrongs to the family of Ekdal, but brings disaster upon them. The title is taken from a beautiful piece of symbolism sustained throughout.

Wilde, JAMES (b. 1892). Welsh boxer, who as a youth worked as a coal miner. Jimmy Wilde soon came to the front as a fly-weight. On Feb. 14, 1916, he defeated Joe Symonds in 12 rounds for the Lonsdale belt for that weight, and next year retained the title in a contest with Tancy Lee, whom he beat in 11 rounds. On March 12, 1917, he won the belt outright. After being in retirement he returned to the ring in 1923, but Pancho Villa defeated him in Wilde's last fight.

Wilde, OSCAR FINGALL O'FLAHERTIE WILLS (1856-1900). Irish writer. The son of Sir William Wilde, an ear and eye specialist, he was born in Dublin, Oct. 15, 1856. His academic career was brilliant, both at Trinity College, Dublin, where he was a friend of Edward Carson, who was later to

contribute to his downfall, and at Magdalen College, Oxford, where he gained the Newdigate prize with his poem, *Ravenna*, in 1878. Yet he was less conspicuous for these triumphs than as a leader of the cult of aestheticism; and in London, whither he proceeded with money and no occupation, his affectations, combined with genuine wit, caused him to be at once ridiculed and lionised.

Wilde's first volume of poems, 1881, attracted little attention, but a volume of fairy stories, *The Happy Prince and Other Tales*, 1888, stood on its merits as fantasy of delicacy and charm, not equalled by *The House of Pomegranates*, 1892. The Picture of Dorian Gray, his first novel, 1891, had literary brilliance, but created more attention by the decadence of its theme.

There followed four plays: *Lady Windermere's Fan*, produced at the St. James's Theatre in 1892; *A Woman of No Importance*; *An Ideal Husband*; and *The Importance of Being Earnest*, which, rightly achieving by wit and technical skill an immense success, made Wilde the leading dramatist of his day. *Salomé*, a play he wrote in French, was published with drawings by Beardsley in 1893, and performed in Paris with Bernhardt in the leading rôle, 1894.

Wilde's morals had been freely criticised, though his literary success made him accepted in society. When an open accusation of perversion was made by the marquess of Queensberry in 1895. Wilde brought an action for criminal libel, but Carson's deadly conduct of the defence revealed the truth of the allegation, and on the collapse of Wilde's case he was himself prosecuted and, after the jury had disagreed in the first trial, convicted under the provisions of the Criminal Law Amendment Act. He was sentenced to two years' imprisonment, and on his release went to live in Paris under the name of Sebastian Melmoth. There in poverty and obscurity he died, Nov. 30, 1900. He was buried in the Père Lachaise cemetery, where a bust by Epstein was erected to commemorate him.

His end was the more tragic because Wilde had shown himself a writer of great possibilities as well as a character of extreme flamboy-



Jonathan Wild,
English criminal
From an old print



Oscar Wilde,
Irish author
Downey



Sir Ernest Wild,
British lawyer
Russell

ance. Though *The Ballad of Reading Gaol*, 1898, has passages of great power and beauty, and other writings are challenging and original, it is through his plays that Wilde lives, a master of paradox and the wittiest dramatist of the century. Parts of an apologetia, *De Profundis*, written in prison, were pub. in 1905, but the complete text did not appear until 1949.

Bibliography. Lives, A. Gide, 1905; F. Harris, 1918; R. H. Sherard, 1928; A. Symons, 1930; G. J. Renier, 1933; H. Pearson, 3rd ed., 1947; *Trials of O. W.*, ed. H. M. Hyde, 1948; *The Paradox of O. W.*, G. Woodcock, 1949.

Wilbehest. See Gnu.

Wilder, THORNTON NIVEN (b. 1897). An American novelist and dramatist. Born April 17, 1897, at



Thornton Wilder,
American novelist

Madison, Wis., he had a cosmopolitan upbringing in California, China, and Rome. During 1921-28 he was a schoolmaster in New Jersey, and during 1930-36 on the staff of Chicago university. Wilder revealed from his earliest writings a style of distinction for all its quietness; he could invest even a platitude with some poetic thought, and dealt especially well with simple characters. After *The Cabala* (1925), which was set in Rome, he gained international reputation with a brief novel, *The Bridge of San Luis Rey* (1927), which reconstructed life in 18th century Peru. Enthusiastically praised by Arnold Bennett, it also gained the Pulitzer prize, as did two plays, *Our Town* (1938), with revolutionary tricks of technique, and *The Skin of Our Teeth* (1942), an uproarious parable on the history of *Homo sapiens*. Wilder went to ancient Greece for his tale *The Woman of Andros* (1930), but returned to modern America in the rather flippant *Heaven's My Destination* (1934). In 1948 he published *The Ides of March*.

Wilderness. Any wild and desolate region. The term is specially applied to a district in N.E. Virginia, extending along the S. bank of the Rapidan from Mine Run to Chancellorsville. It became famous in the American Civil War, for here the battle of Chancellorsville was fought in May, 1863. A year later Grant conducted his Wilderness campaign, against Lee; this began in May, 1864, and was marked by a succession of battles

ending with Cold Harbor, June 1-3. (See *American Civil War*; *Chancellorsville*; *Cold Harbor*.)

The Wilderness is the name of a beautiful seaside resort in the Cape prov., S. Africa, lying E. of George and S. of the Outeniqua Mts.

Wild Hunt. Legendary aerial apparition of huntsmen and hounds. Tylor, in his *Primitive Culture*, 1871, describes it as an Aryan storm myth. Teutonic peoples have many stories of the Wild Huntsman, mostly variants of the idea of a man so devoted to the chase that he was doomed to eternal hunting. See *Herne the Hunter*; *Wandering Jew*.

Wilding, ANTHONY FREDERICK (1883-1915). British lawn tennis player. Born in New Zealand, Oct. 31, 1883, he won in 1904 the Scottish gentlemen's singles championship, and, partnered by Miss W. Longhurst, the Scottish mixed doubles. In 1907 he took the All England plate and the English covered courts championship, and, partnered by M. J. G. Ritchie, the covered courts gentlemen's doubles. He gained his first All England singles championship in 1910, and retained the title for three more years. Wilding was killed at Gallipoli, May 10, 1915.

Wildman, SIR JOHN (c. 1621-93). English intriguer. Entering the parliamentary army, he was in 1647 the spokesman of the section of the new model army that before Charles I's execution attacked Cromwell. He was imprisoned for sedition, 1648, and after his release was a leader of the Levellers, but later abandoned their cause, becoming a speculator in forfeited royalist and clerical lands. He sat in parliament, 1654, and set himself to overthrow the protector, but was again imprisoned, being released after two years. Always willing to buy safety at the expense of his fellow plotters after the Restoration he was a republican plotter, being imprisoned 1661-67. Once more the leader of a plot, 1681, he was, however, found not guilty of complicity in the Rye House plot. Wildman was Monmouth's chief agent in England, but at the last moment deserted him, fleeing to Holland, whence he returned with William. Soon suspected of intrigues with the Jacobites, he was deprived in 1691 of his post of investigator of the state trials, yet was knighted 1692. Wildman, having, as Macaulay, said, "a wonderful skill in grazing the edge of treason," died June 2, 1693. *Consult* J. W., Plotter and Postmaster, M. Ashley, 1947.

Wildspitze. Alpine peak of the Oetzthal group in Austrian Tirol. It is situated about 20 m. N.W. of Meran, and has an alt. of 12,470 ft.

Wildstrubel. Alpine peak of Switzerland, in the Bernese Oberland (*q.v.*), near Leukerbad or Lœche-les-Bains. It rises to an alt. of 10,676 ft.

Wilenski, REGINALD HOWARD (b. 1887). English art critic. Born in London and educated at S. Paul's school and Balliol College, Oxford, he became known by his advocacy of advanced painters, enraging the more academic writers and artists, while he disarmed them by bland and almost impenetrable logic. The *Modern Movement in Art*, 1927, was the first book in which he put forward views later elaborated in *The Meaning of Modern Sculpture*, 1932, and *The Study of Art*, 1934. *Italian Painting*, 1929; *Introduction to Dutch Art*, 1929; *French Painting*, 1931; *John Ruskin*, 1933; *English Painting*, 1933; and *Modern French Painters*, 1940, showed Wilenski to be also a vigorous critic of the older schools of art and maintained his reputation as an artistic iconoclast.

Wilfrid (c. 634-709). English prelate and saint. A Northumbrian by birth, he was educated at Lindisfarne, Rome, and Lyons, and ordained priest. At the synod of Whitby, 664, he persuaded Oswy, king of Northumbria, to submit to Rome, an episode of decisive importance in English Christianity. Consecrated bishop of York, 665, he was excluded from the see by the Anglo-Celtic party, but readmitted in 669. Wilfrid beautified York minster, and built churches at Ripon and Hexham. In 678 he began the evangelisation of the Frisians; he subsequently converted many heathen in Sussex, where miraculous stories have gathered about his name. After a litigious career he died at Oundle, probably on Oct. 3, 709, and was buried at Ripon. Wilfrid was canonised and has a festival on Oct. 12. His *Life* was written by his priest, Eddi.

Wilhelm. German form of the name William, under which two emperors are noticed.

Wilhelmina (b. 1880). Queen of the Netherlands, 1890-1948. Wilhelmina Helena Pauline Maria, daughter of William III of Orange-Nassau, king of the Netherlands, by his second wife Emma of Waldeck-Pyrmont, was born at The Hague, Aug. 31, 1880, and, her father's two sons by his first marriage dying in 1879 and 1884,

she succeeded him on his death Nov. 23, 1890. Queen Emma acted as regent until the princess's 18th birthday, Aug. 31, 1898; Wilhelmina was enthroned on Sept. 6. She married Henry, duke of Mecklenburg-Schwerin, Feb. 8, 1901, and by him had a daughter Juliana (b. April 30, 1909).



Wilhelmina
of the Netherlands

A person of simple tastes and strong Protestant convictions, Wilhelmina lived a quiet life, chiefly in The Hague (where she was often to be seen riding through the streets on her bicycle) until the invasion of her country by the Germans in 1940. She had brought the Netherlands safely through the First Great War as a neutral, and had hoped, having failed in a joint attempt with King Leopold to prevent the Second, to maintain neutrality again. But her country was attacked and overrun. She herself, much against her will at the time, was persuaded to remove in a British warship to England, where she lived in London or its environs as effective head of the Dutch govt. in exile. She broadcast on many occasions from London to her people, to all of whom, R.C. and Protestant alike, she became a symbol of liberation.

She returned to the Netherlands immediately after its liberation in May, 1945. Failing health led her to abdicate Sept. 4, 1948, four days after the celebration of her golden jubilee, in favour of her daughter. She retired into private life as the princess of the Netherlands. *Consult* Queen Wilhelmina, Mother of the Netherlands, P. Paneth, 1944.

Wilhelm Meister. Novel by Goethe (*g.v.*), published in two parts, the *Lehrjahre* or Apprenticeship (1795-96), and the *Wanderjahre* or Travels (1821-29). It traces the history of its hero in a philosophising, discursive, and tedious fashion.

Wilhelmshaven. Seaport and town of Germany. It lies in Jade Bay on the North Sea coast, 41 m. N.W. of Bremen. Bought by Prussia from Oldenburg, it was constructed 1854-69 as Germany's main naval port; exploited under the Weimar govt. as a commercial port; again fortified by the Nazis. It was an impressive, pleasant town, connected with the Frisian islands, Heligoland, and Bremerhaven by steamer; it had a fine town hall and churches in modern brickwork, a museum and naval arsenal, shipyards and engineering plants, and was a resort for about 12,000 visitors a year.

Base of the German North Sea fleet, Wilhelmshaven was frequently and heavily attacked from the air during the Second Great War, being first raided by the R.A.F. on Sept. 4, 1939. The Polish armoured div., attached to the Canadian 1st army, entered Wilhelmshaven, May 7, 1945. After the surrender of Germany it lay in the British zone of occupation, and demolition of docks, ammunition depots, workshops, and wharves was carried out. By the end of 1948 the port had been demilitarised. Some 140 small industries were introduced to employ not only the townspeople, 28,000 in 1939, but also many refugees. In 1947 the Max Planck research institute for oceanology was erected here. Pop. 102,000.

Wilhelmstrasse. Thoroughfare in Berlin. Before its destruction in the battle for Berlin in 1945, it

was one of the most representative streets of the city, 1½ m. long, containing the former palace of the president, the foreign office, and the Reich chancellery. As Quai d'Orsay outside France and Whitehall outside the U.K. stood for the French and British foreign offices respectively, the Wilhelmstrasse outside Germany stood for the German foreign office.

Wilkes, JOHN (1727-97). English politician. Born at Clerkenwell, London, Oct. 17, 1727, son of a malt distiller, he was educated at Leyden. He became known in London as a leader of the profligate *Medmenham Brotherhood*. By Pitt's influence he was



John Wilkes,
British politician

chosen in 1757 M.P. for Aylesbury, and at once proved a thorn in the Tory side. In 1762, with the support of the Whig group led by Temple, he started *The North Briton*, launching vitriolic but witty attacks on the premier, Bute, which helped to bring him down. In No. 45 next year Wilkes described the king's speech as false; by general warrant he was arrested, put in the Tower, but released on the order of Chief Justice Pratt on the ground of breach of privilege. Now was raised the popular cry of Wilkes and Liberty! For a partly printed *Essay on Woman*, Wilkes was pronounced by the house of lords guilty of libel; he fled to the Continent and was outlawed.

Returning in 1768, he was elected M.P. for Middlesex; he was imprisoned and three times expelled from the commons. But he gained enormous influence with the London merchants and the mob, and was chosen lord mayor in 1774. That year at last he was admitted to parliament, where he advocated abolition of rotten boroughs and extension of the franchise, and championed the American colonists, probably inciting them to rebellion. City chamberlain from 1779, he withdrew from parliament in 1790, and died, insolvent as he had mostly lived, Dec. 26, 1797.

Wilkes was an ugly, malicious, and obscene debauchee, who was said never to do a good thing without a bad reason. But he stood out with conspicuous courage and honesty for freedom in speech and print, attacked



Wilhelmshaven, Germany. Plan of the harbour and quays of this former important German naval port

corruption and pettiness in politics, and was eminently trustworthy in office. His constitutional importance is great, for he sounded the death-knell of general warrants, showed that the press could not be muzzled, and established that the govt. could not keep out of parliament an elected representative.

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Wilkes-Barre. City of Pennsylvania, U.S.A., the co. seat of Luzerne co. It stands on the North branch of the Susquehanna river, 16 m. S.W. of Scranton, and is served by the Lehigh Valley and other rlys. In the centre of a productive anthracite region, its manufactures include machine-shop and foundry products. More than one-third of all the anthracite mined in the U.S. is marketed here. First settled in 1769, Wilkes-Barre was incorporated as a borough in 1806, and became a city in 1871. Pop. 86,236.

Wilkie, SIR DAVID (1785-1841). Scottish painter. Born at Culter, Fife, Nov. 18, 1785, Wilkie was the son of the parish minister. After some schooling near home, he began to study art at the Trustees' Academy, Edinburgh.

 Having worked at home on his earliest

David Wilkie
After A. Geddes

pictures, he moved to London and entered the R.A. schools. His success was rapid and great. The Village Politicians was followed by The Blind Fiddler, 1807; The Rent Day, 1807; Blind Man's Buff, 1813; The Letter of Introduction, 1814; Distraint for Rent, 1816; The Penny Wedding, 1819; and Reading a Will, 1821. He was elected A.R.A. in 1809, and R.A. in 1811. After a tour in Europe, made in 1825-28, Wilkie's style changed entirely, an example of his later work being The Queen's First Council. He was returning home from a voyage when he died, off Gibraltar, June 1, 1841. He had been a knight since 1836.

The most popular of Wilkie's many works are those of homely Scottish life. He also painted portraits, and his visits to Paris, Italy, and Spain were followed by productions of work in the style of

the great masters, e.g. Two Spanish Monks of Toledo. Two other popular pictures may be mentioned, John Knox Preaching before the Lords of the Congregation, and The Chelsea Pensioners. See Knox, John; consult also Lives, A. Cunningham, 1843; J. W. Mollett, 1881; E. Pinnington, 1900; Lord R. Gower, 1902.

Wilkins, SIR (GEORGE) HUBERT (b. 1888). Australian explorer. Born at Mount Bryan East, South Australia, Oct. 31, 1888, and educated at the Adelaide school of mines, he acted as photographic correspondent with the Turkish army in the Balkan War, 1912-13. He was photographer to Stefansson's Canadian Arctic expedition, 1913-17, subsequently serving in the Australian flying corps during the First Great War. In 1919 he acted as navigator in the Blackburn Kangaroo aeroplane on a flight from England to Australia. Thereafter he participated in a number of Arctic and Antarctic adventures, which included the British Imperial Antarctic expedition, 1920-21; Shackleton-Rowett expedition, 1921-22; the Detroit Arctic expedition, 1926-27; and the Nautilus Arctic submarine expedition, 1931. These exploits brought him world fame, and he was knighted in 1928. He was manager of the Ellsworth trans-Antarctic expeditions between 1933 and 1939. Sir Hubert's books included Flying the Arctic, 1928, and Under the North Pole, 1931.

Wilkins, JOHN (1614-72). An English divine. Born at Fawsley, Northamptonshire, he was educated at Mag-



John Wilkins,
English divine

calden Hall, Oxford. In 1648, having been vicar of Fawsley since 1637, Wilkins was chosen warden of Wadham College, Oxford. In 1659 he became master of Trinity College, Cambridge, but lost the position at the Restoration (1660). However, he afterwards held livings in Middlesex, London, and Northamptonshire, and in 1668 was elected bishop of Chester. He died in London, Nov. 19, 1672. Wilkins wrote a number of scientific books, but is best known as one of the founders and the first secretary of the Royal Society. Consult Life and Times, P. A. Wright Henderson, 1910.

Wilkinson, ELLEN CICELY (1891-1947). British politician. She was born in Manchester, Oct.



Ellen Wilkinson,
British politician

8, 1891, the daughter of a cotton operative. From an elementary school she went, by the aid of scholarships, to a Manchester secondary school and Manchester university. For a time a teacher, "Red Ellen" (so called from her flaming red hair) turned to journalism and politics, and soon became widely known in the Labour movement. Becoming a member of the Communist party in 1920, she was Labour candidate for Ashton-under-Lyne in 1923. Membership of both parties being declared incompatible by the Labour party, she gave up her allegiance to the Communists.

In 1924 she stood as the successful Labour candidate for Middlesbrough E., which she represented until 1931. A forceful speaker, she did valuable work as a trade union organizer. She came back to parliament in 1935 as member for Jarrow, and did much to bring to notice the tragic results of large-scale unemployment in that town. In 1941 she joined the coalition govt. as parl. secretary to the ministry of Pensions, being transferred later to the ministry of Home Security, where she played a large part in the development of air raid shelters and other aspects of civil defence. After the general election of 1945 she became minister of Education, developing plans already in train under the Education Act of 1944. On Feb. 6, 1947, she died of heart failure in hospital in London.

Wilkinson, JAMES JOHN GARTH (1812-99). English writer. He was born in London, June 3, 1812, was early attracted by William Blake, and at first wrote poetry, which was much influenced by Blake. After 1839 he devoted himself to the elucidation of the works of Swedenborg, acquiring a wide reputation and attracting the attention of Henry James the elder, Emerson, Carlyle, and Dickens. He travelled considerably in Scandinavia and Iceland, visited America, and finally settled in London, where he died, Oct. 18, 1899. Wilkinson was himself a mystic, and to this fact is perhaps due his astonishing insight into Swedenborgian thought. The

rigour and the clarity of his writing did much to spread that doctrine, and won for him an eminent position among members of the New Church. His chief works are the standard biography of Swedenborg, 1849, and the mystical poems, Improvisations from the Spirit, 1857.

Wilkinson, NORMAN (b. 1878). British painter. Born at Cambridge, Nov. 24, 1878, he was educated at Berkhamsted. He became widely known as a marine painter, his work being remarkable for its accuracy and clarity of outline and detail. During the First Great War he served in the R.N.V.R., when he evolved the dazzle system of camouflage against submarine attack. He later became well known as a poster artist. Many of his colour sketches and paintings are in the Imperial War Museum, and in 1944 he presented to the nation 54 pictures of war at sea.

Will. Conscious psychical activity or tendency towards action, usually classed with cognition and feeling as one of the three mental factors. It may be exercised both outwardly and inwardly, according as the aim or result is a bodily movement or a purely psychical process. Three elements are necessary: the existence of motive, or desire directed towards an object: of reflexion, consideration of the desirability and attainability of the object; and of resolution, the idea of power to realize the object.

Will is variously defined as a mental representation of the act followed by a performance of it, a presentation transformed; a mere complex of sensations arranged in a particular way; an innate spontaneity of consciousness, manifested when determined by a feeling of pleasure and pain; a blind, unreasoning force, exercising its activity not only in animate beings, but throughout nature. The most generally accepted view, however, is voluntarism, which lays more stress on volition than on intellect. See Free Will; Predestination.

Will. In law, the legal instrument whereby a man declares what is to be done with his property after his death. By English law every will except that of a sailor at sea, or a soldier or sailor on active service, must be in writing or its equivalent. It must be signed by the testator in the presence of two witnesses both present at the same time, who must in his presence sign as witnesses. In

Scotland, and most other countries, a will signed by the testator, and written entirely by him with his own hand, is good without witnesses; but other wills must be witnessed, in some countries, by a notary public. A will made by a British subject abroad is valid in the United Kingdom if it is made according to English form (by an Englishman) or Scottish form (by a Scotsman). A will made abroad by a foreigner will not be recognized in England unless validly made according to the law of the country where it was executed.

Willamette. River of Oregon, U.S.A. Formed by the union of Middle Fork and McKenzie Fork, both rising in the Cascade range, it flows N. to the Columbia river, which it enters a few miles below Portland. Its course of 250 m. lies through a valley of great fertility. See Meteorite.

Willard, EDWARD SMITH (1853-1915). British actor. Born Jan. 9, 1853, he made his first appearance on the stage at Weymouth, Dec. 26, 1869, and won his earliest London successes as Spider in *The Silver King*, at *The Princess's*, 1882, and James Ralston in *Jim the Penman*, at *The Haymarket*, 1886. Manager of the Shaftesbury Theatre, 1889-90, his season was memorable for his powerful portrayal of Cyrus Blenkarn in H. A. Jones's drama *The Middleman*, and of Judah Llewellyn in *Judah*, by the same author. Willard died Nov. 9, 1915. His nephew Edmund (b. 1884), also an actor, usually played heavy or villainous characters.

Willard, FRANCES ELIZABETH (1839-98). American educationist and reformer. Born at Churchville, N.Y., Sept. 28, 1839, and educated at the North-Western female college at Evanston, Ill., she was a teacher in Pittsburgh female college 1856-66 and principal of the Genesee Wesleyan seminary at Lima, N.Y., 1866-67. In 1874 she became secretary of the national woman's Christian temperance union, of which she was president from 1879. In 1883 she founded the world's woman's Christian temperance union, becoming president in 1888. She took the chair at the women's national council in 1890. She died in New York, Feb. 18, 1898.



Frances Willard,
American
educationist

Willcocks, SIR WILLIAM (1852-1932). British engineer. Born in India and educated at Roorkee College, he was engineer to the Indian public works, 1872-83, transferring to the Egyptian public works until 1897. In 1898 he planned the great dam at Assuan, and in 1911 a vast scheme of irrigation for Mesopotamia (Iraq), by which some 3½ million acres were watered. Made K.C.M.G. in 1902, he wrote *Egyptian Irrigation*, 1899; *The Assuan Reservoir and Lake Moeris*, 1904; *The Irrigation of Mesopotamia*, 1911. He lived until July 28, 1932.

Willemite. An ore mineral of zinc, zinc silicate. It is found at Franklin Furnace, N.J., in Belgium, and elsewhere, associated with other zinc minerals.

Willemstad. Capital of Curaçao (*q.v.*) and of the Netherlands Antilles. Founded soon after Dutch occupation of the island of Curaçao in 1634, Willemstad (William's town, after the second William of Orange) resembles a Dutch 17th century town with its gabled houses. The older part, called Punda (Du. Poenda), to the E. of St. Ann's Bay, is joined to the newer part Otrabanda, or Overdijde (other side), by a ponton bridge. The synagogue, built 1732, a replica of that in Amsterdam, is the oldest in the W. hemisphere. At Willemstad is the seat of justice for the Netherlands Antilles. Variations between day and night temp. are greater than the annual range, which is from 83°3' F. in Sept. to 78°4' F. in Jan.

On the W. coast of the island, Willemstad has one of the finest harbours in the West Indies, consisting of a long narrow channel (St. Ann's Bay) broadening to a large land-locked bay (Schottegat), with water deep enough for the largest liners. Formerly exporting chiefly sugar and tobacco, Willemstad became the seat of the second largest oil refinery in the world, established 1925, for the treatment of oil from Venezuela. Of the 10,000 ships totalling 40,000,000 tons which entered the harbour in 1941, 4,000 totalling 15,000,000 tons were tankers. The importance of the oil refinery here led to the garrisoning of Willemstad after the German occupation of the Netherlands, first by British troops, May 11, 1940, to Jan. 12, 1942, then by U.S. troops. During Jan., 1942, a German submarine attempted to shell the refinery. Pop. 39,678.

Willenhall. Urban dist. and town of Staffs, England. Standing 3 m. E. of Wolverhampton on the

ry., it is a manufacturing centre turning out locks, keys, bolts, and general hardware. Pop. est. 30,370.

Willesden. Borough of Middlesex, England, and a N.W. suburb of London. It includes Brondesbury, Harlesden, Neasden, Kilburn, Kensal Rise, and Cricklewood. Here is an important rly. junction, and the dist. is served by underground rly., bus, and trolley bus. The ancient parish church of S. Mary, a place of pilgrimage in the middle ages, restored 1852 and 1872, contains remains of Norman work. Charles Reade was buried in the churchyard. Large industrial developments took place in the 1930s (see Park Royal). Willesden returns two members to parliament. Pop. est. 180,770.

Willett, WILLIAM (1856-1915). British promoter of daylight saving. Born at Farnham, he became



William Willett,
British builder

a builder and was head of a London firm bearing his name which put up many houses in Kensington. His tireless advocacy of "daylight saving" led to the introduction in 1908 of the unsuccessful first Daylight Saving bill, and it is by this scheme that he is remembered, although he died March 4, 1915, a year before it was actually introduced into the U.K. Petts Wood, Chislehurst, was acquired 1927 and presented to the National Trust as a memorial to Willett. See Summer Time.

William. Masculine Christian name. It means helmet of resolution. In the form Guillaume it is of French origin, and was brought into England by William the Conqueror. The German form is Wilhelm. The feminine is Wilhelmina.

William I (1027-87). King of England, surnamed the Conqueror. He was the illegitimate son of the Norman duke Robert, called the Devil, by Arletta, daughter of a tanner in Falaise (q.v.). Hence William was called by his enemies the Tanner or the Bastard. Despite the irregularity of his birth, the boy's succession as duke of Normandy was recognized by the barons in 1035. In 1047 he defeated a faction at Val-ès-Dunes. Visiting England, he was said to have obtained from Edward the Confessor and Harold Godwinson promises that he should succeed Edward on the throne of England. When Harold himself accepted the

crown in Jan., 1066, in violation of an oath taken upon particularly



William I,
King of England

sacred relics, William prepared a great expedition against the "perjurer," landed at Pevensey, and slew Harold at the battle of Hastings (q.v.), Oct. 14. The magnates assembled in London, acting as the Witenagemot (q.v.), offered William the crown in Westminster abbey at Christmas.

Quickly rebellions in the N. and W. provided excuse for huge forfeitures, while stone castles, with royal garrisons, rose at strategic points all over the country. An insurrection in the N., supported by a fleet from Denmark in 1069, was ruthlessly quelled. Hereward the Wake was put down in E. Anglia. After 1072 William spent most of his time in Normandy. His archbishop, Lanfranc, organized the discipline of the English Church, and with William preserved the independence of Church and crown from papal domination. Besides bringing in a measure of feudalism, William made use of the Saxon system of local jurisdiction. Compilation of Domesday Book (q.v.) was ordered in 1085. The king was thrown from his horse after sacking Mantes, and died at Rouen, Sept 9, 1087. He was a fine soldier and a great administrator, not notably cruel by the standard of his age.

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William II (c. 1056-1100). King of England, called Rufus or the Red King. The second surviving son of William the Conqueror, he was nominated to the English succession by his father, his elder brother Robert succeeding to Normandy. When William became king in 1087, the Norman barons revolted in favour of Robert, but were crushed by William, who received ready aid from the English. He proved a godless and greedy tyrant. He was killed by an arrow while hunting in the New Forest,



William II,
King of England

Aug. 2, 1100. Consult The Reign of Rufus and Accession of Henry I, E. A. Freeman, 1882.

William III (1650-1702). King of Great Britain and Ireland, and stadtholder of Holland. He was

born at The Hague, Nov. 4, 1650, eight days after the death of his father, William II, prince of Orange and stadtholder.



His mother was Mary, daughter of Charles I, so that he was heir

to the English throne after the children of the future James II. The Republicans secured ascendancy in the Netherlands, and the house of Orange was set aside. But when France and England attacked Holland, 1672, promising an Orange restoration, William's partisans murdered the De Witts, unreprieved by the youth who was raised to the stadtholdership.

He became a hero in his country's eyes for desperate bravery in resistance to Louis XIV. A bad general, he was defeated by Condé at Seneffe in 1674 and at St. Omer in 1677; but diplomacy secured the aid of Brandenburg, Austria, and Spain. His marriage to Mary Stuart in 1677 was a triumph, and Louis was compelled to conclude the peace of Nijmegen. By 1688 the league of Augsburg, later to form the nucleus of the Grand Alliance (q.v.), was in being. Events in England had been watched by William with close attention, and he cultivated the interest of the growing opposition to James. When the crisis came to a head he accepted an invitation to "bring over an army and secure the infringed liberties" of England. He landed at Torbay, Nov. 5, 1688; James fled; and William, having accepted the Declaration of Rights, was declared joint sovereign with Mary, Feb. 13, 1689.

He was never popular in England; in Scotland the massacre of Glencoe remains the greatest blot on his name; Ireland declared for James, who was defeated at the battle of the Boyne (q.v.), July 1, 1690, William's only victory; the treaty of Limerick was called treachery by the Irish.

Meanwhile the war on the Continent had broken out again; William lost Namur, was routed

William R
After Netscher

at Steinkirk and Neerwinden, but never despaired, and his brilliant diplomacy secured favourable terms at the peace of Ryswick, 1697. But when Charles II of Spain left all his dominions to the grandson of Louis XIV, William's work was undone, and war became inevitable before he died, March 8, 1702, as the result of a fall from his horse, which tripped over a mole-hill. The way in which William died led Jacobites to toast the "little gentleman in the velvet jacket."

William's immense difficulties at home and abroad embittered his naturally sullen character. Contempt for the panoply of kingship, and abhorrence of gaiety, further undermined his popularity. But he was respected and acclaimed as a champion. William had one ruling passion, the prevention of French aggrandisement, and to that task he gave himself with a selflessness which alone made tolerable the enormous demands upon his English and Dutch kingdoms. He made up in statecraft what he lacked in other qualities. *See* Kensington Palace illus.; Petersfield.

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William IV (1765-1837). King of Great Britain and Ireland. Third son of George III, he was born at Buckingham Palace, Aug. 21, 1765. Warmly attached to the navy, in which he served 1779-90, he enjoyed some popularity as the sailor prince, being also duke of Clarence. He was lord high admiral in 1827. The lover of Dorothy Jordan, the actress, he married in 1818 Adelaide of Saxe-Meiningen. On his accession in 1830 he was regarded as a supporter of the Whigs. William favoured the Reform Bill, but only with extreme reluctance did he promise, if called upon, to create enough peers to secure its passage through the lords. Except for dismissing Melbourne in favour of Peel, 1834, he took no further political action. He died June 20,



William IV,
King of Great
Britain
From a miniature

1837. *See* Reform Acts. *Consult* Life and Times, P. H. Fitzgerald, 1884; The Patriot King, G. E. Thompson, 1932.

William I (1797-1888). German emperor and king of Prussia. He was born March 22, 1797, second son of Frederick William III of Prussia, and was a soldier from youth, fighting in the last Napoleonic campaign. Driven from Prussia by the democratic movement of 1848, on its

failure he resumed his former position. Field-marshal from 1854, he became regent during the illness of his brother, Frederick William IV, in 1858, and succeeded to the throne Jan. 2, 1861. William found in Bismarck (*q.v.*) a statesman prepared to harness the law to the service of ambitious designs, and from 1862 let him control the state. The king was Bismarck's instrument in the complications which issued in the Franco-Prussian War, sending to him the Ems Telegram (*q.v.*). At Versailles, during the siege of Paris, he was proclaimed the first German emperor, Jan. 18, 1871. William died March 9, 1888. He married Augusta of Saxe-Weimar, and his children were his successors, Frederick, and Louise, grand duchess of Baden. *See* Bismarck; Germany; Hohenzollern. *Consult* The Emperor William, E. Simon, 1886; Life, A. Forbes, 1888; Life and Times, P. Wiegler, Eng. trans. 1929.

William II (1859-1941). German emperor and king of Prussia, 1888-1918. Born in Berlin, Jan. 27, 1859, he was the eldest son of Frederick, afterwards German emperor, and his wife Victoria, daughter of Queen Victoria. He was baptized Friedrich Wilhelm Victor Albrecht, and after a spell of private tuition was sent to Cassel and then to Bonn. In 1881 he married Augusta Victoria of Slesvig-Holstein.

On June 15, 1888, William succeeded his father as king and emperor, and for 30 years was one of the foremost figures in Europe, especially after 1890, when he dismissed Bismarck and became himself the director of Germany's policy. His restless energy led him to make spectacular tours, such as the one to the Holy Land in 1898, to rush to London and other capitals and discuss affairs of state

with sovereigns and statesmen, and to make himself noticeable by martial speeches to his troops. At one time he seemed sincerely anxious to keep the peace; at others determined to cause trouble. He was consistent, however, in his efforts to give Germany a "place in the sun," to maintain her army, extend her colonial empire, foster her trade, and make her heard, if not always respected, on all questions of international politics. He supported the idea of a great German navy, but above all, with the army as the main support of his throne, believed that he ruled by divine right.

The clash of German and British interests in Africa; his attitude in the Sino-Japanese war of 1894 and towards the S. African War; his notorious telegram to Kruger in 1896; his crude Morocco land-



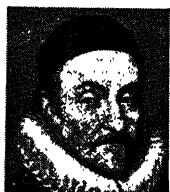
break of the First Great War; right, in his later years

ing in 1905; his consent to the sending of the gunboat Panther to Agadir in 1911—all these things helped to increase tension in Europe. Yet though his turbulent foreign policy was always directed by the desire for German expansion, he appeared to believe that peace could be maintained by the power of German weapons. Even in 1914 he believed that war could be averted and manoeuvred to avoid it; yet he must be held largely responsible for the conditions of strain that finally produced the explosion. Throughout the First Great War popular opinion in Great Britain found in "the kaiser" the prime culprit. During its course, as nominal commander-in-chief, he fitted from place to place in the battle areas. Believing that Germany would yet triumph, he refused to read the signs pointing to her downfall in the autumn of 1918. When told that his cause was hopeless he reluctantly abdicated on Nov. 9, and fled ignominiously into Holland, where the castle of Doorn was later granted to him for his residence.

The treaty of peace declared the ex-kaiser a criminal, and arrange-

ments were made for his trial in London. On Jan. 16, 1920, his extradition was formally demanded, but it was refused by the Dutch, and for the rest of his life he lived in retirement at Doorn. His wife died in 1921, having borne six sons and a daughter. In 1922 he married Princess Hermine von Schönaich-Carolath (née Reuss). He died June 4, 1941. His second wife survived until Aug. 7, 1947. The ex-kaiser's defence of his career and policy was translated into English as *Comparative Historical Tabulations from 1878 to the Outbreak of War in 1914*. See Agadir; Germany; Hohenzollern. *Consult* The German Emperor, C. Lowe, 1895; The Kaiser in Exile, Lady Norah Bentinck, 1921; William II, E. Ludwig, 1926; Fabulous Monster, J. D. Chamier, 1934.

William, PRINCE OF ORANGE (1533-84). Dutch soldier and statesman, called the Silent because, although in fact talkative, he could keep his own counsel about matters of moment. Eldest son of William, prince of Nassau, he was born at Dillenburg, April 25, 1533, and in 1544 inherited the title of prince of Orange. His wealth and position made him important, and he was brought up in the R.C. faith at the court



William the Silent
After J. van Mierevelt

of Charles V at Brussels, where he was one of the emperor's closest friends. He served Charles as a diplomatist, and was one in 1559 at Cateau-Cambrésis, where it was that he first earned his famous nickname.

Soon after 1555, when Philip II became ruler of the Netherlands, William took his stand among the nobles who protested against the tyranny of Alva, while about the same time his religious opinions became Calvinist. Treasonable actions in preparing a revolt led to his outlawry in Germany. When the revolt began in 1572 he was its leader and he acted as such until his end. Fifteen provinces formed a league of which William was chief. Philip set a price on his head, and after several unsuccessful attempts, he was shot and killed by Balthasar Gerard at Delft, July 10, 1584. Married four times, William left three sons. The eldest had been removed to Spain, and he was succeeded by Maurice,

the second. *Consult* Revolt of the Netherlands, P. Geyl, 1932; William the Silent, C. V. Wedgwood, 1944.

William (b. 1941). British prince. The eldest son of Henry, duke of Gloucester, he was born Dec. 18, 1941, and christened William Henry Andrew Frederick.

William. Schoolboy hero of novels and short stories by Richmal Crompton. Originally appearing in *Just William*, 1922, William Brown does everything with the best intention and usually the worst result. His family—father, mother, and sister Ethel; his friends, headed by Ginger and Violet Elizabeth; and Hubert Lane, with whom William carries on a feud, all became popular characters, and like William himself were transferred with great success to screen, stage, and radio, the first broadcast of a long series being made in 1945.

William of Wykeham (1324-1404). English prelate. Born at Wickham, near Fareham, and educated at the old grammar school at Winchester, he attracted the notice of Edward III, who made him chaplain in 1349 and in 1356 appointed him the surveyor of works at Windsor. Here he built much of the castle. His career was extraordinarily successful; between 1359 and 1361 he held no fewer than 19 canonries and other ecclesiastical offices which led to the bishopric of Winchester and the lord chancellorship, both in 1367. Having resigned the chancellorship in 1371, he was impeached and deprived of his emoluments. On the accession of Richard II, 1377, Wykeham received a full pardon and was reinstated in his bishopric. He was again lord chancellor, 1389-91, and he died at Waltham, Hants, Sept. 27, 1404. William of Wykeham will always be remembered as the founder of colleges at Winchester and Oxford. He was the leading advocate of Perpendicular architecture, and exceptionally honest for a medieval administrator. His *Life* was written by G. H. Moberly, 1893; G. C. Heseltine, 1932. See *New College*; Winchester College.

Williams, ALFRED OWEN (1877-1930). British poet. A carpenter's son, he was born at



Alfred Williams,
British poet

South Marston, Wilts., Feb. 7, 1877. He became a farm worker when 11, a rivet boy at the Swindon works of the then G.W.R. when 14, and was later a head forgerman and stamper. In spare time he learned Greek and Latin, and in 1909 published *Songs in Wiltshire*. His other works include *Poems in Wiltshire*, 1911; *War Sonnets and Songs*, and *Life in a Railway Factory*, 1915. Later he taught himself Sanskrit, and published translations from that language. Selected *Poems* appeared in 1926. Williams died in extreme poverty, April 10, 1930. *Consult* *Lives*, H. Byett, 1933; L. Clack, 1945.

Williams, BRANSBY (b. 1870). British actor, born Aug. 14, 1870. He left a commercial career for the stage in 1896 and made his name as an impersonator of popular actors. He appeared at the principal London music halls with studies of characters from Dickens. In 1922 he produced *David Copperfield* at Brixton, doubling the parts of Micawber and Peggotty, and next year played *Hamlet* at Birmingham. Williams also acted in films, notably *Soldiers of the King*, 1933.



Bransby Williams,
British actor

Williams, CHARLES WALTER STANSBY (1886-1945). British writer. Born Sept. 20, 1886, he was educated at St. Albans and London university. His unusually varied work embraced poetry, poetic drama, biography, criticism, and novels. The poetry, beginning with *The Silver Stair*, 1912, was often obscure and had a limited appeal, but some novels with a supernatural element, conceived on broad Miltonic themes, were widely read: *War in Heaven*, 1930; *Many Dimensions*, 1931; *The Place of the Lion*, 1931; *The Greater Triumphs*, 1932; *All Hallows Eve*, 1944. Williams understood mystical experience and showed insight into the problem of good and evil. A poetic drama about Cranmer was performed at Canterbury in 1936. The figure of Beatrice was a study of Dante. Williams wrote an

introduction to Milton's poems and edited those of Hopkins. He died May 15, 1945.

Williams, DAVID (1738-1816). Founder of the Royal Literary Fund (*q.v.*). Born at Watford,



David Williams,
founder of the R.L.F.
From a silhouette

Glam, he was trained as a dissenting minister, but after officiating at Frome, Exeter, and Highgate, he opened in 1776 a chapel in Margaret Street, London, on an avowedly deistic principles. He also engaged in educational work, and was a prolific writer on political and religious subjects. It was at a club in Chelsea that he first broached the idea of a society for the relief of distressed authors; and the Royal Literary Fund was started on his initiative in 1788. A friend of Garrick, Goldsmith, and Johnson, Williams died June 29, 1816.

Williams, EMLYN (b. 1905). Welsh man of the theatre. He was born at Mostyn, Flintshire,

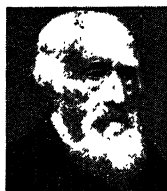


Emlyn Williams,
Welsh actor and
playwright

Nov. 16, 1905, and went from Holywell county school to a brilliant career as a linguist at Christ Church, Oxford. His London debut was on April 4, 1927, in *And So To Bed*, with which piece he went to New York the same year. His own first play was *Glamour*, 1928. Williams rose to equal eminence as playwright, producer, and actor, often simultaneously; while he translated or adapted foreign plays and wrote film dialogue. The parts of Angelo, in *On the Spot*, and Lord Lebanon (his favourite), in *The Case of the Frightened Lady*, made his name. His *Richard III* was talked of in 1937, and his barrister in *The Winslow Boy*, 1946, was an awe-inspiring figure. Critics differed in their ranking order of Williams's original and varied dramatic experiments, but mention must be made of *A Murder Has Been Arranged*, 1930, and *Night Must Fall*, 1935, thrillers in which the murderer was known to the audience; *The Corn Is Green*,

1938, the partly autobiographical story of a poor boy gaining an Oxford scholarship; *The Light of Heart*, 1940, melodrama that was really moving; *The Wind of Heaven*, 1945, a study of religious revivalism in Wales; *Trespas*, 1947, an essay in the occult.

Williams, SIR GEORGE (1821-1905). Founder of the Y.M.C.A. He was born at Dulverton, Oct. 11,



Sir George Williams,
founder of Y.M.C.A.

1821, and in 1841 became an assistant in the drapery house of Hitchcock & Co., St. Paul's Churchyard, London. He arranged prayer meetings among his fellow employees, and in 1844, with eleven other young men, founded the Young Men's Christian Association (*q.v.*). Williams became treasurer in 1863 and president in 1886. Knighted in 1894, he died at Torquay, Nov. 6, 1905. *Consult* Life, J. E. Hodder Williams, 1918.

Williams, JOHN (1796-1839). British missionary. Born at Tottenham, June 29, 1796, he was

sent by the London Missionary Society in 1816 to the Society Islands. Here and in the neighbouring islands he did excellent work until murdered by cannibals in Erromanga, Nov. 20, 1839. He started schools, wrote text-books, translated the N.T. into native tongues, and in 1837 issued an account of his enterprises. Six successive missionary ships named after him were maintained by Sunday schools from 1844. The *John Williams V* was wrecked off Samoa, Dec. 22, 1948.

Williams, RALPH VAUGHAN. This British composer is entered under Vaughan Williams.

Williams, ROGER (c. 1600-84). English colonist and writer. Born probably in London and educated at Sutton's Hospital (Charterhouse) and Pembroke College, Cambridge, he took orders in the Church of England, but became a nonconformist, and left for America in 1631. Landing in Massachusetts, he became pastor of the church in the Puritan stronghold of Salem, but having been

expelled in 1636, he founded a settlement on Narragansett Bay, which he called Providence.

The first Baptist church in America was established by Williams, but he afterwards withdrew from the communion. He twice visited England, in 1643 to obtain a charter for Rhode Island Colony, and in 1651-54, when he became acquainted with Milton and Cromwell. On return he was president of the colony till 1658. A pioneer of religious liberty, Williams upheld the right of every man to hold whatever religious opinions he chose. He wrote *A Key into the Languages of the Indians of America*. *Consult* Lives, O. S. Straus, 1894; E. J. Carpenter, 1909; R. W. and the English Revolution, J. Ernst, 1931.

Williams, SIR WILLIAM FENWICK (1800-83). British soldier. Born at Halifax, N.S., Dec. 4, 1800, he entered the Royal Artillery in 1825, and in 1854 was appointed British commissioner with the Turkish army in Anatolia. Making his way to Kars, he thoroughly reorganized the Turkish forces, and made a memorable defence of the city against the Russians, though eventually compelled to capitulate. The "hero of Kars" was created K.C.B., 1856; was M.P. for Calne, 1856-59; commander-in-chief in Canada, 1859-65; governor of Nova Scotia, 1865-70; and of Gibraltar, 1870-76. Williams died July 26, 1883.

Williamsburg. A city of Virginia, U.S.A., the co. seat of James City co. It stands between the rivers York and James, 47 m. E.S.E. of Richmond, and is served by the Chesapeake and Ohio rly. It contains William and Mary College, chartered 1693, next to Harvard the oldest educational institution in the U.S.A. The city has been subjected to a unique piece of restoration in 18th-century style: 77 colonial buildings have been restored and 189 reconstructed from their foundations, while roads, squares, gardens, and greens have reverted to their original aspect. Much of the cost was borne by J. D. Rockefeller, jr. Settled in 1632, Williamsburg was the state capital from 1698 to 1779; and was chartered as a city in 1722. On May 5, 1862, an indecisive battle was fought here between the Confederates and Federals. Pop. 3,942.

Williams - Ellis, CLOUGH (b. 1883). British architect. Educated at Oundle and Trinity College, Cambridge, he became a leading advocate of town and country



John Williams,
British missionary
After R. Easton

planning. He purchased the site on which he designed and erected the model resort of Portmeirion, N. Wales. He converted Bonar Law College, Ashridge; made alterations at Stowe school; and did work at Dartmouth House and the Ladies' Carlton club, London. He became president of the Design and Industry Association, and chairman of the Society for Preservation of Rural Wales. He married in 1915 Amabel, daughter of St. Loe Strachey, and with her wrote *The Pleasures of Architecture*. Other books were *Architecture Here and Now* (with J. Summerson); *The Adventure of Building; England and the Octopus*; and *A History of the Tank Corps*. (See *Architecture*, p. 577.) Amabel Williams-Ellis wrote a number of instructive books for children.

Williamson, ALEXANDER WILLIAM (1824-1904). British chemist. Born at Wandsworth, May 1, 1824, he studied chemistry under Gmelin at Heidelberg, and Liebig at Giessen. Professor of chemistry at University College, London, 1849-87, he took a prominent part in the development of chemical theory, elucidated the problem of the formation of ether from alcohol and sulphuric acid, and first advanced views that are fundamental in the hypothesis of ionic dissociation. He died May 6, 1904.

Williamson, SIR ANDREW WALLACE (1856-1926). Scottish divine. He was born at Thornhill, Dumfriesshire, Dec. 29, 1856, and attended Morton school, Wallace Hall, and Edinburgh university. He became minister at N. Leith, 1882; S. Cuthbert's, Edinburgh, 1883-1909; S. Giles's, Edinburgh, 1910-25. This celebrated preacher was university lecturer in pastoral theology, 1897-98; moderator of the Church of Scotland, 1913-14; dean of the order of the Thistle and of the Chapel Royal, and chaplain to the king in Scotland. He died July 10, 1926, having just been knighted.

Williamson, CHARLES NORRIS (1857-1920). A British novelist, born at Exeter. He abandoned engineering in 1880 for journalism, and founded *Black and White* in 1891, editing it for two years. His stories, written in conjunction with his American wife, Alice Muriel Williamson (1875-1933), deal largely with the romance of motoring, and include *The Lightning Conductor*, 1902; *The Princess Passes*, 1904; *The Car of Destiny*, 1906. Williamson died Oct. 5, 1920.

Williamson, HENRY (b. 1897). English author. A Bedfordshire man, he made a name after the



Henry Williamson,
English author

First Great War, in which he fought as a private, with a four-volume autobiography, published 1921-28, and eventually collected as *The Flax of Dream*. Meanwhile Tarka the Otter, a penetrating piece of nature study in fictional form, had won him the Hawthornden prize in 1927. This was followed in 1935 by another nature book, *Salar the Salmon*. Williamson's disillusion with the military mind found expression in *The Wet Flanders Plain*, 1929, and *The Patriot's Progress*, 1930. Later he published *The Story of a Norfolk Farm*, 1941; *The Sun in the Sands*, 1944.

Williamson, WILLIAM CRAWFORD (1816-95). British botanist. Born at Scarborough, Nov. 23, 1816, he early showed a preference for the line of research which made him later the greatest British authority upon the plants of the Carboniferous period, though he qualified and practised as a surgeon. His memoirs on fossil plants were illustrated by his own drawings. Professor of botany at Owens College, Manchester, from 1851, he retired in 1892, and died June 23, 1895.

Williamsport. City of Pennsylvania, U.S.A., the co. seat of Lycoming co. A popular summer resort, it stands on the west branch of the Susquehanna river, 94 m. N. by W. of Harrisburg, and is served by the Pennsylvania and other rlys. An important lumber market, with a boom capable of receiving some 300 million ft. of logs, it had no other industry until 1910; but now has iron and steel works, engine and boiler plants, and manufactures glass, furniture, leather, farm implements, rubber, silk, clothing, gas engines, foundry and machine-shop products, and boots and shoes. Williamsport was incorporated in 1806, and became a city in 1866. Pop. 44,355.

Williamstown. City and seaport of Victoria, Australia. Virtually a suburb of Melbourne, from which it lies 4½ m. direct and 9 m. by rly. S.W., it has seven commodious piers at which the largest vessels can be berthed, patent slips and graving yards—one purchased in 1942 by the Common-

wealth government—and carries on shipbuilding. There are also govt. rly. works, woollen mills, engineering, basalt quarries, glass works, flour mills, oil refineries, and an ammonia plant. Pop. 26,640.

Willibrord (657-738). English saint and missionary to the Frisians. A hermit's son, he was born in Northumberland, and educated at Ripon and in Ireland. About 690 he went as a missionary to the Frisian tribes around the mouth of the Rhine, and settled at Utrecht, of which place he was in 696 made archbishop. He preached in the Netherlands and Denmark, and is regarded as the apostle of Christianity in the Netherlands. Dying Nov. 6, 738, he was buried near Trier, and miracles were said to occur at his tomb.

Willingdon, FREEMAN FREEMAN-THOMAS, 1ST MARQUESS OF (1866-1941). British administrator. Born Sept. 12, 1866, he was educated at Eton and Trinity College, Cambridge. He was in the



Lord Willingdon,
British administrator
H. W. Barnett

university cricket eleven for four years, and also played for Sussex. A.D.C. to his father-in-law, Lord Brassey (*q.v.*), when governor of Victoria, 1895-98, Freeman-Thomas entered politics in 1900 as Liberal M.P. for Hastings. Junior lord of the Treasury, 1905-1912, he represented Bodmin during 1906-10; then he was raised to the peerage as a baron.

In 1913 he went to India as governor of Bombay; in 1918, a few months after relinquishing this appointment, he became governor of Madras. During this period he did much to assist the Indians towards self-government, and at the end of his term, 1924, was raised to a viscounty. In 1926 he went to China as chairman of an Anglo-Chinese mission, but was recalled to become governor-general of Canada. Five years later he returned to India as viceroy until 1936, and in this office persuaded Gandhi to come to London for the round-table conference on Indian reform. Raised to a marquessate in 1936, he died Aug. 12, 1941, when his title passed to his son Inigo (b. 1899), formerly known as Viscount Ratendone.

Willis, NATHANIEL PARKER (1806-67). American author. Born at Portland, Maine, Jan. 20, 1806, and educated at Boston,

Mass., Andover, and Yale, he wrote a good deal of ephemeral verse and several novels. He is best



N. P. Willis,
American author

known in Great Britain by his Pencilings by the Way, 1835, which first appeared in the columns of the New York Mirror. These sketches of English literary celebrities, the outcome of a visit to Europe in 1831, roused considerable ill-feeling against Willis in London, the charge being that he had published private conversations. He died Jan. 20, 1867.

Willis, THOMAS (1621-75). English physician. Born Jan. 27, 1621, in Wiltshire, he graduated from Christ Church, Oxford, in 1639, and in 1660 became Seditian professor of natural philosophy in the university. He wrote several works in Latin about the brain and nerves. Setting up a practice in London in 1666, he continued to publish his medical treatises, specialising in the study of urinary diseases, and discovering the presence of sugar in the urine in certain forms of diabetes. A founder member of the Royal Society, he died Nov. 11, 1675.

Willis's Rooms. Former London place of amusement. In King Street, St. James's, the rooms were opened in 1863 as a successor to Almack's (*q.v.*), and were the scene of many notable gatherings, including the farewell banquet to Charles Mathews, Jan. 10, 1870.

Willkie, WENDELL LEWIS (1892-1944). American business man and politician. Born of

German stock at Elwood, Ind., Feb. 18, 1892, he worked his way through the university of Indiana and then studied law. Success as legal adviser to a public utility company led to his entering the business world. In 1933 he became president of the Southern and Commonwealth corporation; in that capacity he came into conflict with Roosevelt's Tennessee Valley scheme as a champion of private enterprise against the state. This led to the adoption of Wilkie, though a Democrat, as

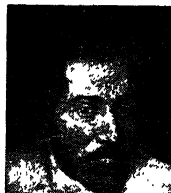


Wendell Willkie,
American politician

Republican candidate at the 1940 presidential election, and he secured a larger vote than his predecessors in 1932 and 1936. An unofficial visit he paid to Great Britain in 1941, when he was received by the king, the prime minister, and other members of the cabinet, convinced him of that country's courage and determination, and made him its firm friend. Willkie supported the foreign policy of Roosevelt, who in 1942 appointed him special representative in the Near East, Russia, and China. Experiences during his tour were recorded in One World, 1943, which sold over a million copies. Willkie died in New York, Oct. 7, 1944.

Will-o'-the-Wisp. Popular name for the pale light frequently seen at night over marshes, and more correctly known as Ignis Fatuus (*q.v.*).

Willoughby, SIR HUGH (c. 1500-54). English explorer. Son of Sir Henry Willoughby of Risley,

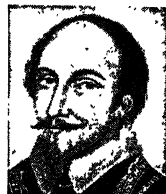


Sir Hugh Willoughby,
English explorer
Wollaton Hall

he served in the Scottish war of 1544, when he was knighted. In 1553 he was dispatched, in command of three vessels, to find a north-east passage to India and Cathay. The ships were dispersed by a gale off the Norwegian coast, but Willoughby's and one of the other vessels made the harbour of Arzina, in Lapland, where everyone perished of scurvy. The third vessel of the expedition was commanded by Richard Chancellor (*q.v.*), who made his way into Russia.

Willoughby de Broke, BARON. English title held by the Willoughby and Verney families since 1491. The barony was granted to Sir Robert Willoughby, who had fought at Bosworth and later commanded the English armies in France. The title fell into abeyance on the death of his son Robert in 1522, but was successfully claimed in 1694 by Sir George Verney, who took his seat in parliament as 11th baron. From him the title descended to Henry Peyto, 16th baron, who died childless in 1852. He was succeeded by his nephew, Robert John, from whom the title descended until in 1923 it came to John (b. May 21, 1896), 20th baron. The family seat is at Compton Verney, Warwick. *Pron.* Willowby de Brook.

Willoughby de Eresby, PEREGRINE BERTIE, BARON (1555-1601). English soldier. Born at Cleves,



Baron Willoughby
de Eresby,
English soldier
From an old print

Oct. 12, 1555, and brought up in England, he succeeded to the barony of Willoughby de Eresby in 1580. He took part in the campaign in the Netherlands, became governor of Bergen-op-Zoom, distinguished himself in several battles, and in 1587 took command of the English army. After the successful defence of Bergen in the autumn of 1588, he resigned his command and retired to England. A few months later he joined Henry of Navarre in command of an English expedition at Dieppe, and fought in the campaign in N. France, and brought his army home early in 1590. After some years in retirement on the Continent, Willoughby was made governor of Berwick, and took part in the negotiations between the English and Scottish courts. He died June 25, 1601. Lord Willoughby de Eresby is still the courtesy title of the eldest son of the earl of Ancaster (*q.v.*). *Pron.* Willowby Dersby.

Willow (*Salix*). Genus of trees and shrubs of the family Salicaceae. They are chiefly



Willow. Leaves and
male catkins of *Salix*
fragilis

natives of the N. temperate regions, and some attain to a height of 80 ft. Willows may be planted in heavy moist soils, in autumn or spring, preferably by the margins of lakes, ponds, and streams, and are propagated by shoots or cuttings taken at the same periods of the year. One of the commonest species is the crack willow (*S. fragilis*), which receives its name from the readiness with which the branches break from the stem. The dwarf or shrubby species of willows are known as osiers (*q.v.*). Wood of the willow is used for cricket bats, chair making, the handles of agricultural implements, clogs, and many other purposes.

The weeping willow (*S. babylonica*), native of E. Asia, is so called on account of the drooping habit of its leaves. The willow of the Babylonian dist. is really a species of poplar (*Populus euphratica*).

Willow Herb, ROSEBAY, OR FRENCH WILLOW (*Epilobium angustifolium*). Perennial herb of

the family Onagraceae, native of Europe, N. and W. Asia, and America. It has unbranched stems four feet high, with alternate lance-shaped leaves. The stems end in a long spray of rosy-purple flowers, each an inch across. The slender seed capsules, numbering over 200 to each plant, are 3-4 ins. long, and each contains some 400 seeds attached to bundles of long, silky hairs. Called fireweed in the U.S.A., the plant flourishes particularly on burnt sites, e.g. of heath fires and charcoal burnings, and became the typical weed of the bombed areas of London.

Willow Pattern Ware. Class of English china printed with an elaborate design of Chinese origin. It was first produced about 1780 by Thomas Turner (1749-1809) at Caughley, Shropshire, and imitated by other potters. The design, in blue, on a white or bluish-white ground, represents a river with houses, gardens, a bridge, trees, human figures, and birds, and is supposed to illustrate the story of a mandarin's daughter who eloped with her father's secretary, the couple when pursued being transformed into a pair of doves. See



Willow Herb. Spikes of the rosy flowers



Willow Pattern Ware. Plate showing the story of the Chinese mandarin's daughter

Pottery. Consult Ceramic Art of Great Britain, L. Jewitt, 1878; History and Description of English Porcelain, W. Burton, 1902.

Willow Run. The site, 30 m. from Detroit, U.S.A., of a mammoth aircraft factory established by Henry Ford during the Second Great War. Here he adapted his familiar method of motor production to creating a moving assembly line covering every stage in building four-engined Liberator bombers. The original plan called for turning out a bomber an hour, but this rate was not actually reached. To prevent use of faulty parts, vital castings were X-rayed, and every part was specifically examined. The plant included a training school, which cost £125,000.

Wills. The name of a British family of tobacco manufacturers. The founder of the family fortunes, Henry Overton Wills (1761-1826), joined his father-in-law, William Day, in a tobacco-manufacturing business in Bristol. He left his share in the firm to two sons, William Day (1797-1865) and Henry Overton (1800-71) under whose names the firm, with premises in Redcliffe St., became W. D. & H. O. Wills. The elder was succeeded by his son William Henry Wills (1830-1911), who became first chairman of the Imperial Tobacco co. in 1901; he was created Baron Winterstoke in 1906, but the title became extinct at his death. H. O. Wills II had three sons: Henry Overton III (1828-1911), who was the father of Sir George Alfred Wills (1854-1928), created baronet in 1923; Sir Edward Payson Wills (1834-1910), made a baronet in 1904, and the father of Sir Edward Channing Wills (1861-1921), on whose death the title passed to a younger brother, Sir Ernest Salter Wills (b. 1869); and Sir Frederick Wills (1838-1909), who was made a baronet in 1897, and whose son Gilbert Alan Hamilton Wills (b. 1880) was created Baron Dufferin in 1929. The family made munificent gifts to Bristol university, endowing the Henry Overton Wills chair of physics, and building the new physics laboratories, opened in 1929.

Wills, WILLIAM GORMAN (1828-91). British dramatist. Born Jan. 28, 1828, at Kilmurry, son of James Wills, the biographer, and educated at Trinity College, Dublin, he came to London, and attained some vogue as a portrait painter, becoming known also for his Bohemian habits. He wrote a number of dramas, some of which

were still played in the provinces after the First Great War. The best known are Charles I, 1872; Jane Shore, 1876; A Royal Divorce, 1891.

He was also the author of the song, I'll sing thee songs of Araby. He died Dec. 13, 1891.

Wills, WILLIAM JOHN (1834-61). British explorer. A Devon man,

born at Totnes, Jan. 5, 1834, he emigrated to Victoria in 1852, and worked first as a shepherd and later as a surveyor. In 1860 he joined the expedition to cross the continent from south to north under Robert Burke (q.v.), becoming second in command. With a few companions Wills and Burke pushed on to within a few miles of the Gulf of Carpentaria, reaching the tidal river Flinders, but on their return journey they were overtaken by starvation, and all but one man died at Cooper's Creek, June, 1861.

Will's Coffee-House. Once famous literary resort in London. Situated at the N.W. corner of Russell Street and Bow Street, Covent Garden, and named after its founder, William Urwin, it was a favourite haunt of Dryden, Wycherley, Pope, and other writers.

Will Shakespeare. Play by Clemence Dane. Based on episodes, some imaginary, from the life of Shakespeare, it was in blank verse. Produced at the Shaftesbury Theatre, London, Nov. 17, 1921, it became one of the most successful plays of its time.

Wills-Moody, HELEN (b. 1905). American lawn tennis player. Born at Berkeley, Calif., Oct. 6, 1905, daughter of a doctor, she attended the state university. She won the national lawn tennis championship in 1923, reached the final against K. McKane on her first visit to Wimbledon next year, and after the retirement in



W. G. Wills, British dramatist



William J. Wills, Australian explorer



Helen Wills-Moody, American lawn tennis player

1926 of S. Lenglen she was invincible at singles until defeated in 1933 by Helen Jacobs in America. Tall and stately, she played a game of deadly accuracy and unbreakable control mainly from the baseline. Seven times champion of the U.S.A., four times in succession of France, she created a record at Wimbledon by winning on each of the eight times she entered between 1927 and 1938. Regarding the game as a recreation, she was a painter and designer, wrote novels, and published in 1937 an autobiography with the punning title *Fifteen-Thirty*. She married Frederick Moody in 1927, and the polo player Aidan Roark in 1939.

Willstätter, RICHARD (b. 1872). German chemist, born at Karlsruhe, Aug. 13, 1872. He studied at Munich and there was appointed lecturer, 1896, and professor, 1902; he transferred to Zürich, 1905, and in 1912 joined the Berlin research laboratory of the Kaiser Wilhelm institute and simultaneously was professor in the university. While teaching at Munich university, 1915-25, he did valuable research into chlorophyll, vegetable colours, photo-synthesis, catalytic hydration, and fermentation; this helped to revolutionise the dyeing industry. Publications appeared on chlorophyll (1913), assimilation of carbonic acid (1918), and enzymes (1928). Willstätter also discovered a method for transforming ligneous substance into sugar. In 1915 he was awarded the Nobel prize for chemistry; in 1933 the Willard-Gibbs medal of the American Chemical Society.

Wilmington. Village and parish of Sussex, England. It is situated 6 m. N.W. of Eastbourne. There are the ruins of a Benedictine priory, founded in 1088, and now embodied in a farm house. On the down near by is the Long Man of Wilmington, a gigantic figure 240 ft. high, cut in the side of the hill and visible for miles. The figure holds a staff in each hand and has been outlined in white bricks. It is probably of ancient British origin.

Wilmington. Largest city of Delaware, U.S.A., the co. seat of New Castle co. A port of entry, it stands on Delaware river and Christiana and Brandywine Creeks, 26 m. S.W. of Philadelphia, and is served by the Baltimore and Ohio and other rlys. The Old Swedes' church of Holy Trinity, erected in 1698, is regarded as the oldest church in the U.S.A. in which services are still held. There are shipbuilding yards, rly. workshops,

and various other industries, but business is dominated by the E. I. du Pont de Nemours powder company. The Swedes, who built a fort here in 1638, were succeeded in 1655 by Dutch settlers, who were followed in 1664 by the English. Louis Philippe and Cobett were both teachers here during exile. Wilmington was incorporated as a borough in 1739, and became a city in 1832. The only place in Delaware with pop. over 6,000, it has 112,504.

Wilmington. City of North Carolina, U.S.A., the co. seat of New Hanover co. A port of entry, it stands on Cape Fear river, about 30 m. from its embouchure into the Atlantic, and is served by the Atlantic Coast and Seaboard Air Line rlys. Settled in 1730, it was called Newtown until 1739, when it was incorporated; it became a city in 1866. Government shipyards were built in both Great Wars; in peace time fertilisers are the principal product. Pop. 33,407, of whom 40 p.c. are negroes.

Wilmslow. Urban dist. and town of Cheshire, England. Situated on the Bollin, 6 m. N.W. of Macclesfield, it has a rly. station, and is largely residential. The parish church of S. Bartholomew contains a fine rood screen and monuments. Pop. 16,500.

Wilno. Polish name of the capital of Lithuania S.S.R., described under its more familiar Russian name of Vilna.

Wilson, HENRY MAITLAND WILSON, 1ST BARON (b. 1831). British soldier. An Etonian, he



Lord Wilson,
British soldier

was commissioned in the Rifle Brigade, 1900, served in the S. African War, and fought in France and Belgium during the First Great War, when he was awarded the D.S.O. After commanding the 2nd div. at Aldershot from 1937, he became c.-in-c., Egypt, on the outbreak of the Second Great War, and in 1941 was transferred to Cyrenaica as military governor. He led British forces in the five weeks' campaign in Greece, was promoted full general, and led Allied forces which occupied Damascus and Beirut. Having been c.-in-c., Persia and Iraq, and then in the Middle East, he was during 1944 supreme allied commander in the Mediterranean, in which capa-

city he was responsible for the Allied landing in the S. of France. In Nov. he succeeded Dill as head of the British joint staff mission in Washington, and the prime minister's personal representative to the president on military matters, remaining there until 1947. He attended the conferences at Yalta and Potsdam as a military adviser. Knighted in 1940, he was promoted field-marshal in 1944, and raised to the peerage in 1946 as Baron Wilson of Libya and Stowlangtoft.

Wilson, CHARLES THOMSON REES (b. 1869). British physicist. He was born at Glencorse, Midlothian, Feb. 14, 1869, and educated at Owens College, Manchester, and Sidney Sussex College, Cambridge. A fellow of the latter for some years, he became Jacksonian professor of natural philosophy at Cambridge in 1925, retiring in 1934. A brilliant research worker on ionisation and atmospheric electricity, he shared the Nobel prize for physics in 1927 with A. H. Compton (*q.v.*), chiefly because of his invention of the cloud chamber method of displaying the tracks of individually charged particles. He was created C.H. in 1937.

Wilson, SIR CHARLES WILLIAM (1836-1905). British soldier and archaeologist. Born at Liverpool March 14, 1836, and educated at Cheltenham and Bonn, he joined the Royal Engineers in 1855. He served on the commission that marked out the boundary between the U.S.A. and British Columbia, 1858-62, and in 1864-65 made a survey of Jerusalem and the surrounding district, work which led to the establishment of the Palestine Exploration Fund (*q.v.*). In 1882, while serving in Egypt, he was appointed chief of the intelligence department, and was thus concerned in the expedition for the relief of Gordon. Director-general of the ordnance survey, 1886-93, and of military education at the War office, 1892-98, Wilson died Oct. 25, 1905. He published *From Korti to Khartoum*, 1885; *Lord Clive*, 1890; and various writings on his work as a surveyor.

Wilson, EDWARD ADRIAN (1872-1912). English explorer. Born at Cheltenham, July 23, 1872, he was



Sir Charles Wilson,
British soldier

a qualified doctor, a brilliant illustrator, and a keen, well-informed naturalist, and was selected by Capt. Scott as medical officer and zoologist in the Discovery expedition of 1901-04. He was employed 1905-10 in research on grouse disease, which proved extremely valuable. In 1910 he joined Scott's last expedition to the Antarctic. Having reached the South Pole with his leader in 1912, he perished with him on the way back, about March 29. *Consult* Edward Wilson, G. Seaver, 1933.

Wilson, Sir Henry Fuller Maitland (1859-1941). British scholar. Born Feb. 18, 1859, and educated at Eton, he joined the Rifle Brigade in 1878, and saw active service at once in Afghanistan. He went through the S. African War and spent 1907-11 on the general staff in India. He had a distinguished record in the First Great War, commanding the 2nd Essex in the retreat from Mons, a division in France, and a corps in the Salonica expedition. On Nov. 13, 1918, now lieutenant-gen., he landed at Constantinople (Istanbul) as commander of the Allied forces occupying Turkish territory under the armistice terms. He was created K.C.B. in 1915, retired in 1921, and lived until Nov. 16, 1941.

Wilson, Sir Henry Hughes (1864-1922). British soldier. Born May 5, 1864, at Edgeworthstown, co. Longford, he went to Marlborough and Sandhurst, and entered the Royal Irish regiment, 1884, transferring to the Rifle Brigade the same year. He served in



Sir Henry H. Wilson,
British soldier
Russell

Burma, 1885-87, and in the S. African War. Assistant director of staff duties, War office, 1904-06; commandant of the staff college, 1907-10; director of military operations, 1910-14; he went to France on the outbreak of the First Great War as assistant chief of staff to French, was later a corps commander, then chief liaison officer with the French supreme command. After a period in command of the Eastern division at home, and a visit to Russia with Milner's mission in 1916, Wilson returned to France, 1917, as British military representative on the Allies' war council at Versailles. This post he vacated in Feb., 1918, when he succeeded Robertson as C.I.G.S. Wilson

was knighted in 1915, made a baronet and promoted field-marshal in 1919, and awarded £10,000 for his special war services. Leaving the War office in 1922, he was elected M.P. for N. Down, but on June 22 he was attacked and assassinated outside his own house in Eaton Place, London, by Sinn Féin sympathisers. As he was at the time returning from a ceremony he was in uniform, and died with his sword drawn against his assailants.

Wilson, Sir Horace John (b. 1882). British civil servant. He was born Aug. 23, 1882, and went from Kumella school, Bournemouth, to the London School of Economics. In 1900 he entered the civil service, rising to be permanent secretary to the ministry of Labour in 1921. In 1924 he was knighted, and three years later appointed chief industrial adviser to the govt. Seconded to the Treasury from 1935, he was the principal assistant to Chamberlain in his policy of appeasement, which led to the Munich Crisis (q.v.). Sir Horace was permanent secretary to the Treasury and head of the civil service 1939-42.

Wilson, (James) Harold (b. 1916). British politician. He was born at Huddersfield, March 11, 1916, and educated at Milnsbridge council school; Royds Hall, Huddersfield; Wirral grammar school; and Jesus College, Oxford. From 1938 a fellow of University College, Oxford, he joined the war cabinet secretariat in 1940 as economic assistant, and during 1943-44 was director of economics and statistics to the ministry of Fuel and Power. Elected Labour M.P. for Ormskirk in 1945, he was appointed parl. secretary to the ministry of Works. After a few months in 1947 as secretary for overseas trade, he became president of the board of trade, the youngest holder of high office for many years.

Wilson, John (1785-1854). Scottish author, also known by his pen-name of Christopher North. He was born at Paisley, May 18, 1785, and educated at Glasgow university and Magdalen College, Oxford. After a period of residence in the Lake District, the loss of his fortune determined him to go to Edinburgh. He became con-

nected with Blackwood's Magazine, and with Lockhart was the mainstay of that periodical. In



John Wilson,
Scottish author

1820 Wilson was appointed professor of moral philosophy at Edinburgh university. He died April 3, 1854. His fame chiefly rests on the *Noctes Ambrosianae*, a series of dialogues purporting to have been spoken at Ambrose's Tavern, Edinburgh. *Consult* Christopher North: John Wilson, E. Swann, 1934.

Wilson, John Dover (b. 1881). English scholar. He was born in London, July 13, 1881, and educated at Lancing College and Gonville and Caius College, Cambridge. After a short time as a teacher, he was lecturer in English literature at Helsingfors (Helsinki) university, Finland, during 1906-09, and at Goldsmith's College, London, during 1909-12. An inspector of schools for a time, he became professor of education at London university, 1924, transferring to Edinburgh university later; there he was professor of rhetoric and English literature from 1936 to 1945.

Dover Wilson was best known for his studies of Shakespeare, on whom he wrote many books, including: *Life in Shakespeare's England*, 1911; *The Essential Shakespeare*, 1932; *The Manuscript of Shakespeare's Hamlet*, 1935; *The Fortunes of Falstaff*, 1943. He also edited, jointly with Sir A. Quiller-Couch, the *New Shakespeare*, which was an attempt to produce a text both readable and correct.

Wilson, John Mackay (1804-35). Scottish author. Born near Berwick-on-Tweed, Aug. 15, 1804, the son of a millwright, he became a printer. He drifted into literature and lecturing, and after a period in London returned to Berwick as editor of *The Berwick Advertiser* in



J. M. Wilson,
Scottish author
After J. Gellatly

1832. He is chiefly remembered by the well-known *Tales of the Borders*, started in 1834 as a weekly publication. He died Oct. 2, 1835.

Wilson, JOSEPH HAVELOCK (1859-1929). British labour leader. After receiving his early education



Havelock Wilson,
British labour leader

at the Boys' British School, Sunderland, he ran away to sea when 12 years old. When he left the sea, he began to agitate for better conditions for seamen, becoming president of the national sailors' and firemen's union. M.P. for Middlesbrough, 1892-1900 and 1906-10, he represented S. Shields, 1918-22. His autobiography, *My Stormy Voyage Through Life*, appeared in 1925. He died April 16, 1929. See Merchant Navy.

Wilson, RICHARD (1714-82). British painter. Born at Penegoes, Mont., Aug. 1, 1714, he went to London in 1729, studied under T. Wright, and became a portrait painter. He was in Italy during 1749-55, when he abandoned portraits for landscapes, and on his return failed to attain success owing to the indifference of the public who preferred the realism of Hogarth and Gainsborough. One of the 36 original Academicians in 1768, he became librarian to the R. A. in 1776. He died at Llanberis, May 15, 1782.

Of great importance in the development of English painting, Wilson's idealistic and poetical style, deriving from Salvator Rosa and Claude, produced supreme examples of imaginative insight. Many of his mountain landscapes, such as those of Snowdon and Cader Idris, romantic excursions of impressive strength and mastery, had influence on Turner. Nine of Wilson's paintings are at the National Gallery, and he is represented also at S. Kensington, Glasgow, and in private collections. His *Destruction of the Children of Niobe* was ruined in bomb damage to the Tate Gallery during the Second Great War. An exhibition of 131 paintings and drawings was held at Birmingham in 1948. Consult R. W., the Grand Classic, A. Bury, 1947.

Wilson, THOMAS (1663-1755). English prelate. Born at Burton, Cheshire, Dec. 20, 1663, and edu-

cated at Trinity College, Dublin, he was ordained in 1686, and was for some years domestic chaplain to the earl of Derby, through whose influence he was appointed bishop of Sodor and Man in 1697. He did a great work in building churches and establishing schools, and died March 7, 1755.

Wilson, (THOMAS) WOODROW (1856-1924). American president. Born at Staunton, Virginia, Dec. 28, 1856, he came of Scottish and Northern Irish stock, his father being a Presbyterian minister. Educated at Davidson College, N. Carolina, and at the universities of Princeton and Virginia, his student career was brilliant. He became a lawyer and practised for a time at Atlanta, Georgia.

Already a student of political science, he published his thesis for a degree, Congressional Government, in 1885. In the same year he was chosen associate professor of history at Bryn Mawr College, moving in 1888 to the Wesleyan university as professor of political economy. In 1890 he became professor of jurisprudence and politics at Princeton, and during 1902-11 he was its president.

In 1910, Wilson, a Democrat, was elected governor of New Jersey, where he initiated vigorous reforms. This brought him before the public, and in 1912, after a spirited contest, he was chosen Democratic candidate for the presidency. The election gave him



Thomas Wilson,
English prelate
After R. Phillips

6,200,000 votes, a large majority over a Republican vote split between Roosevelt and Taft.

As president, Wilson carried out the Democratic programme with celerity, reducing the tariff, establishing a federal income tax, and reforming the currency. He declined to embroil the U.S.A. for the sake of American interests in Mexico, and in face of great disorders contended that the Mexicans must be left alone to work out their own salvation. Wilson induced congress to conform to treaty obligations by repealing its Act exempting American shipping from Panama Canal tolls, and he negotiated treaties with Great Britain, France, the S. American republics, etc., by which in the event of disputes, a year had to elapse before a resort to arms.

When the First Great War broke out in 1914, Wilson was resolute in neutrality. He would not denounce the devastation of Belgium, but was incensed at the British

maritime blockade and for a while exasperated the Allies by public speeches on 'peace without victory,' the "freedom of the seas," and a league to enforce



peace. However, Wilson kept the U.S.A. out of the war, and on that record he was re-elected president in 1916 by a narrow margin.

His second term had hardly begun when Germany's unlimited U-boat campaign forced him to assent to America's entry into the



Richard Wilson's landscape, *On the Wye*, one of his fine paintings in the National Gallery, London

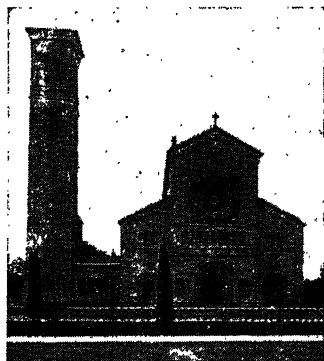
war. In an address to congress, Jan. 8, 1918, he first laid down his famous Fourteen Points (*g.v.*) as a programme of world peace. In other speeches he insisted on a peace that would conform to abstract justice and national aspirations, and he advocated especially the principle of self-determination. After the armistice Wilson went to Paris in Dec., 1918, as the head of the U.S. delegation to the peace conference.

In Europe he was regarded as the "man of destiny," the mouthpiece of an entirely united nation, and was received with enthusiasm. But before sailing he had already lost to the Republicans both his majority in congress and his control of the foreign relations committee.

In Paris Wilson achieved his first concern, the adoption of the League of Nations, but he bought his success dearly. Bitter and factious Republican opposition

awaited his ideas at home, and in Europe he was confronted by the old nationalist prejudices. After signing the peace treaty in 1919 he returned to America, and undertook a strenuous speech-making tour to plead the cause of the League of Nations. But he suffered a complete nervous breakdown in late Sept., in the middle of his tour. The refusal of the senate to ratify the treaty caused Wilson, from his sick bed, to advise the Democrats to stake all on the election of 1920. But in this they were overwhelmingly defeated, and the U.S.A. did not enter the League of Nations. Wilson, who never recovered his health, lived in retirement in Washington until his death, Feb. 3, 1924.

Wilson, who was awarded the Nobel peace prize in 1920, married twice, his first wife dying in 1914 during his presidency. His own most important publications were *The State*, 1889; *History of the*



Wilton, Wiltshire. Façade and campanile of the church, in the Lombard style, built in 1844

Frith

American People, 1902; Constitutional Govt. in the U.S.A., 1908. See Versailles, Treaty of.

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Wilton. Ancient bor. and market town of Wilts, England. It stands on the river Wylye, 2½ m. W. of Salisbury, and has a rly. station.

Wilton House, seat of the earl of Pembroke, is famous for its associations with Shakespeare, Sidney, and other Elizabethans, and its collection of pictures and works of art. Wilton gives its name to a kind of carpet which has long been made here. Sheep fairs are held. Here A. G. Street was born and resided. Pop. est. 2,600. See Carpet.

Wiltshire. County of England. In the S. of the country, its area is 1,345 sq. m., between Berks, Hants, Dorset, Somerset, and Glos. Partly hilly, it is divided into two portions by the Vale of Pewsey; the northern and more fertile one includes the Marlborough Downs, while the southern, in which are numerous valleys, contains Salisbury Plain. Inkpen Beacon, partly in Berks, reaches 975 ft., the highest point. The county embraces parts of Cranborne Chase and the New Forest, and the whole of Savernake



Wiltshire. Map of this agricultural and pastoral southern county of England



Wilton arms

Forest. The chief rivers are the Bristol Avon, Salisbury Avon, Kennet, Ebbie, and Nadder. Main industries are keeping sheep, dairy farming, and the production of cheese and bacon. Oats and other cereals are grown. Salisbury is the county town, but Swindon is the largest. Among attractive old market towns are Marlborough, Chippenham, Calne, Warminster, Devizes, Trowbridge, Malmesbury, and Wilton, after which the county is named. Sights include Salisbury cathedral; Lacock and Malmesbury abbeys; Fonthill, Bowood, and Longleat among houses. Beautiful villages are too numerous to name. There are one bor., 4 co. constituencies. Pop. 303,373.

Wiltshire is rich in British, Roman, and Anglo-Saxon remains, notably Stonehenge and the stone circle of Avebury. Wansdyke is an ancient downland track, but the six white horses in the chalk are modern, that at Westbury dating from 1778. Wiltshire had some flourishing towns in Anglo-Saxon times. Religious houses were founded and castles built under the Normans. Later the county became noted for wool and cloth.

LITERARY ASSOCIATIONS, ETC. The roll begins with the 12th cent. historian, William of Malmesbury. Among famous sons of the county may be noted Sir John Davies, 17th century poet, born at Tisbury; Massinger, at Salisbury; Hobbes, at Malmesbury; Aubrey, at Easton Pierse; 1st earl of Clarendon, at Dinton; Addison, at Milston, near Amesbury; Jefferies, at Swindon, and Alfred Williams, near it; A. G. Street, at Wilton. Sidney is said to have written his *Arcadia* at Wilton; and James Thomson his *Spring* at Marlborough. George Herbert was rector of Bemerton. East Knoyle was the birthplace of Wren. Among books in which local colour may be found are Jefferies's *Story of My Heart*, and Weyman's *The Castle Inn*. The King's England vol. on Wiltshire came out in 1939.

Wiltshire Regiment. Unit of the British army. Raised in Scotland in 1756 as the 62nd

Foot, it became the 2nd bn. of the 4th Foot (King's Own Royal Lancaster Regiment) in 1757, but was made a separate corps the following year. Its first active service was with Wolfe at Quebec. In the American War of Independence the 62nd Foot acted as light infantry and earned the nickname of Springers. Two battle honours were won under Wellington in the Peninsular War. The 62nd was engaged in the Sikh War, Crimean War, China War (1860), and Zulu War. In 1874 the regt. was given the subsidiary title, Duke of Edinburgh's, and in 1881 absorbed as its second bn. the 99th Foot, which, raised in Scotland in 1824, had spent its early years guarding convicts in New South Wales, and saw its first active service against the Maoris, 1845-48. Both bns. fought in the S. African War.

Twelve bns. of the Wiltshire Regt. were raised during the First Great War and earned the battle honours: Mons; Messines, 1914,

campaigns. It is now a regt. of the Royal Armoured Corps. The standard book on the Wiltshire Yeomanry is by Col. W. Pitt.

Wimbledon. Parl. and mun. bor. of Surrey, England. It is 7 m. S.W. of London and is served by rly., underground rly., tram, bus, and trolley bus. Its common of 1,000 acres, public property since 1871, was the scene of the N.R.A. meetings, 1860-89, and has remains of a Celtic earthwork, called Caesar's Camp. In 1922 it was enlarged by 42 acres laid out as a war memorial garden. The parish church, S. Mary's, founded in the



Wimbledon arms



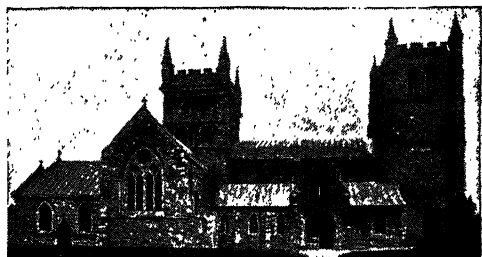
Wimbledon, Surrey. View of the common and the old windmill

'17, '18; Ypres, 1914, '17; Somme, 1916, '18; Arras, 1917; Bapaume, 1918; Macedonia, 1915-18; Gallipoli, 1915-16; Palestine, 1917-18; Bagdad. In the Second Great War bns. fought in Burma and N.W. Europe. The depot is at Devizes.

Wiltshire Yeomanry. Senior cavalry regt. of the British territorial army. It was raised in 1794

as a volunteer regt. for home defence against the threatened French invasion. It first saw active service in the S. African War, when it provided a company for the 1st Imperial Yeomanry. In the First Great War the regt. fought under Allenby in Egypt and Palestine. At the outbreak of the Second Great War, it moved to Palestine with the 1st cavalry div., and after the campaign in Syria was mechanised and joined the 8th army. It was the first British armoured unit to break through the German lines at Alamein, and thereafter fought through the N. Africa and Italy

14th century, was rebuilt 1788, 1843, and 1860, and has a mortuary chapel erected by Viscount Wimbledon (d. 1638). Near are the headquarters of the All-England lawn tennis club where the famous tournament is held annually in June-July. Wimbledon, chartered in 1905, gives its name to a bor. constituency. Pop. 59,000. See Lawn Tennis.



Wimborne, Dorset. North side and main doorway of the cruciform minster of S. Outhberga

Consult History and Antiquities of Wimborne, W. A. Bartlett, 1865; Wimbledon Common, W. Johnson, 1912; G. Boas, 1947.

Wimborne. Urban dist. and market town of Dorset, England. It is 6 m. N. of Poole by rly. Mentioned by early writers as Viburnan, it was probably a Roman station, but grew to importance



Wiltshire Regiment badge

was with Wolfe at Quebec. In the American War of Independen-

with the building of the collegiate church or minster of S. Cuthberga, founded by Edward the Confessor in 1043. Cruciform in plan, this has a transitional Norman tower, a 15th century Perp. tower at the W. end, a lunar orrery, and a chained library. There is a free grammar school in Wimborne, at which Matthew Prior, a native, was educated. Market day, Tues. Pop. approx. 4,250.

Wimborne, VISCOUNT. British title borne by the family of Guest. In 1838 Sir Josiah Guest, M.P. (1785–1852), a wealthy iron-master in S. Wales, was made a baronet. His son Ivor (1835–1914) was made Baron Wimborne in 1880. His son, Ivor Churchill Guest (1873–1939), after education at Eton and Trinity College, Cambridge, and service in the S. African War, was M.P. for Plymouth 1900–06, then for Cardiff until in 1910 he was raised to the peerage as Baron Ashby St. Ledgers. Paymaster-general 1910–12, and lord-lieutenant of Ireland, 1915–18, he succeeded to his father's barony, 1914, and was raised in 1918 to a viscounty. This came on his death, June 14, 1939, to his son Ivor (b. Feb. 21, 1903).

Wimereux. Village of France. In the dept. of Pas-de-Calais, it stands 4 m. N. of Boulogne-sur-

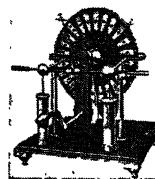


1st Visct. Wimborne,
British politician
Russell

and became a black-and-white artist. He served in the S. African War with Paget's Horse, and soon after his return to England began writing for the stage, supplying lyrics for many successful musical comedies, e.g. *The Arcadians*, 1909; *The Balkan Princess*, 1910; *The Sunshine Girl*, 1912. Later he wrote, alone or in collaboration, the words for musical shows, also light comedies, e.g. *The Passing Show*, 1914; *Bric-a-Brac*, 1915; *My Lady Frayle*, 1916; *Bluebeard's Eighth Wife*, 1922; *A Warm Corner*, 1929. He also provided scripts for films.

Wimsey, LORD PETER. Hero of the detective novels of Dorothy L. Sayers (*q.v.*). Making his first appearance in *Whose Body?*, 1923, he was featured in some 10 other novels, as well as in short stories; on the stage he appeared in *Busman's Honeymoon* (by Dorothy Sayers and M. St. Clare Byrne), produced at the Comedy Theatre, London, in 1936, when the part was played by Dennis Arundell. Lord Peter, a former Oxford cricket blue and a skilled musician, is superficially a rather cynical young man about town; but his intellect, under a veneer of mental lethargy, is first-rate, enabling him to solve the most complicated problems in detection. He has also an interest in works of art of obscure periods, satisfied by his immense wealth.

Wimshurst Machine. In electricity, a self-exciting induction machine for producing static electricity. It has two glass plates mounted on the same spindle but



Wimshurst Machine.
Model of the self-
exciting induction
machine which
produces static
electricity

revolving in opposite directions. The machine is named after James Wimshurst, F.R.S. (1832–1903), who invented it and who personally built nearly 100 specimens of various types.

Winant, JOHN GILBERT (1889–1947). American politician and diplomatist. Born in New York, Feb. 23, 1889, he went from S. Paul's school, Concord, N.H., to Princeton university. After a short period as history teacher at his old school, he entered the



J. G. Winant,
American diplomatist

New Hampshire legislature as a Republican, though with progressive ideas. When the U.S.A. entered the First Great War Winant joined the expeditionary force, commanding one of the first air squadrons to serve in Europe. After the war he made a fortune as part discoverer and exploiter of oilfields in Texas, but continued his political career in New Hampshire. For three terms he was governor of the state, being elected in 1925, 1931, and 1933. In 1935 he became assistant director of the I.L.O. in Geneva, being appointed director in 1938, and supervising its removal to Canada early in the Second Great War. Winant had always supported Roosevelt's "new deal," and the president sent him to London as ambassador in 1941. In 1946 he received an honorary O.M., and returned to the U.S.A., where he committed suicide on Nov. 3, 1947. His book, *A Letter from Grosvenor Square*, appeared thereafter.

Wincanton. Town of Somerset, England. It is situated 10 m. S.E. of Wells, and has rly. connexion with Templecombe. It was originally called Wyndcaleton, after the river Cale, which flows near. The town was almost destroyed by fire in 1707, and the 14th cen.



Wimereux, France. Air view of the village, a British hospital base in the First Great War, and G.H.Q. of the B.E.F. in the Second Great War

Mer, at the mouth of the small Wimereux stream, and is a bathing resort. It was an important British hospital base during the First Great War; and during the later stages of the withdrawal of the B.E.F., 1940, it became G.H.Q.

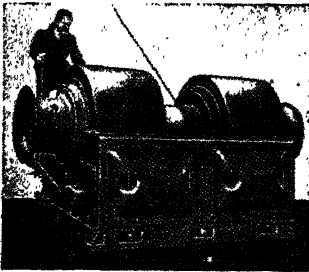
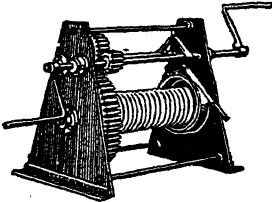
Wimperis, ARTHUR HAROLD (b. 1874). British writer for the theatre. Born in London, Dec. 3, 1874, he was educated at Dulwich,

revolving in opposite directions. On the outer sides of the plates or disks are a number of tinfoil strips. On either side of the plates, which are well varnished, is a diametrical conductor, consisting of tinsel brushes which almost touch the plates. Collecting combs occupy an intermediate position almost touching the tinfoil strips, and are connected to the inner coatings of

tury tower of the otherwise modern church is almost the only old building, though a house is alleged to be that where William of Orange stayed on his way from Torbay to London, after the first engagement in the Revolution of 1688. There is agricultural trade. Pop. 2,000.

Winceby. Village and parish in the Lindsey div. of Lincs, England. It is 5 m. E. of Horncastle, and is noted as the scene of a battle in which the parliamentary forces routed the Royalists, Oct. 11, 1643.

Winch (A.-S. *wince*, bent handle). Device for drawing a load or lifting a weight. In its simple form it con-



Winch. A motor-driven, enclosed two-gear winch used on passenger ships. Top, type used as builders' hoist

By courtesy of Clarke, Chapman & Co., Ltd.

sists of a pair of frames spaced apart, fixed to a common base and providing secure bearings for a shaft which projects on either side where it is twice bent to a right angle to form a cranked handle. A rope is secured to the shaft and wound round it by turning a handle. By this means a load may be drawn along, or by passing the rope round an elevated pulley a weight may be lifted.

Winchcombe. Market town of Gloucestershire, England. It is situated in a valley of the Cotswolds, 7 m. N.E. of Cheltenham on the rly. S. Peter's is a 15th century church freely restored, and the whole town is architecturally celebrated. Near by is Hailes abbey. Pop. 2,741.

Winchell, WALTER (b. 1897). An American journalist. Born in New York, April 7, 1897, he joined a juvenile vaudeville company at 13, later appearing as an adult variety artist. In 1922 he joined the staff of the Vaudeville News, and from 1924 was dramatic critic of the New York Evening Graphic. In 1929 he transferred to the New York Daily Mirror, being engaged in the same capacity, but soon making a name by a daily column of sensational gossip, in which he discussed almost all aspects of events of the day. His "feud" with Ben Bernie was eagerly followed. Winchell also acted as a radio commentator and appeared in films.

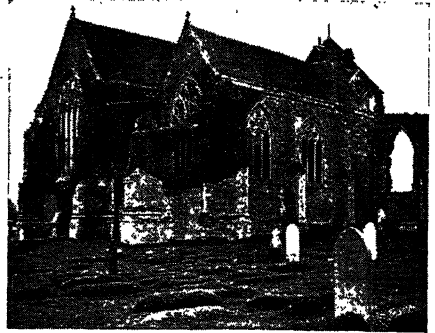


Walter Winchell, American journalist



Winchelsea arms

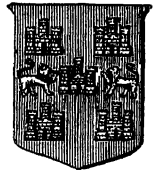
of Hastings. The original town was made a Cinque Port by William I and was a useful seaport. The new Winchelsea was founded by Edward I and did a busy trade, but in the 16th century the har-



Winchelsea, Sussex. Parish church of S. Thomas & Becket, built in the new Winchelsea founded by Edward I

bour became choked; since then the town has dwindled in size, although until the Reform Act of 1832 it returned two members to parliament. Its buildings include the parish church of S. Thomas & Becket, a court house, town hall, and four of the old town gates. There is a rly. station. Pop. 150. For the peerage, see Winchelsea.

Winchester. City and co. town of Hants, England. It stands on the Itchen, 66 m. S.W. of London and 12 m. N. of Southampton, and has rly. stations. It is a market for the surrounding agricultural produce; a military centre, with barracks; and had its own M.P. until 1918, when it became part of a co. div. Pop. 22,969.



Winchester arms

The bishopric of Winchester ranks as one of the most important in the country. The cathedral, originally dedicated to S. Swithun, is the longest in England (526 ft.) and has some magnificent features, especially the nave. It is largely Gothic, but some Norman work survives. Early in the 20th century the foundations were found to be faulty and an extensive restora-



Winchester, Hampshire. The cathedral, the longest in England, viewed from Winchester College

tion scheme was completed. Of the other churches S. Swithun's, a tiny building over the King's Gate, is the most notable. Secular buildings include the ruins of Wolvesey Castle, official residence of the bishop; the city cross; and the county hall, wherein is the so-called round table of King Arthur. The West Gate stands at the top of High Street, and the only other relic of the fortifications is King's Gate leading to the close. One mile S. is the hospital of S. Cross (*q.v.*).

Winchester was a Celtic, and later a Roman settlement, its early name being Venta Belgarum. It



Winchester College arms

S. Mary at Winchester, and it has had from the first a close connexion with New College, Oxford, where scholarships are still reserved for Winchester boys. The nucleus of the school is the chapel, cloisters, quadrangle, and

other buildings of the 14th century still used by the 70 scholars. Around are newer buildings and the 10 houses in which live the commoners, about 400 in number. Classics are the chief subject of study, but mathematics, science, and modern languages are also taught. Winchester boys call themselves Wykehamists. The school motto is *Manners Maketh Man*. Sir

Herbert Baker designed a notable memorial of the First Great War. See St. Catherine's Hill.



Winchester, Hampshire. The high street, showing (right) the elaborate pinnaced 14th century Butter Cross

became the capital of Wessex, and was for a time the capital of England. Here the Anglo-Saxon kings held their court and here many are buried. William I built a castle here. Winchester had a large annual fair held on St. Giles's Hill, just outside the city. See Alfred; Almshouses; Austen, J.; Pilgrims' Way; Reredos. Consult Winchester, G. W. Kitchin, 1890.

Winchester, MARQUESS OF. An English title, the premier of its class. It has been borne by the family of Paulet (*q.v.*) since 1551, when Sir William Paulet, who held high office under Henry VIII and Edward VI, was promoted from earl. His descendant John (d. 1675), 5th marquess, was the nobleman who held Basing House for Charles I. His son Charles (d. 1699), 6th marquess, was made duke of Bolton in 1689, and from then until 1794 the two titles were united. That year Henry, 6th duke and 11th marquess, died without sons; the dukedom became extinct, but the marquessate passed to George Paulet (d. 1800), a descendant of the 4th marquess. The peerage came in 1899 to Henry (b. Oct. 30, 1862), 16th marquess, a soldier, who was president of the T.A., 1909-17. See Basing House.

Winchester College. English public school. Founded by William

of Wykeham in 1382, it is the oldest of the great schools, and on it the existing public school system has been largely modelled. Its full title is the College of

St. Mary at Winchester, and it has had from the first a close connexion with New College, Oxford, where scholarships are still reserved for Winchester boys. The nucleus of the school is the chapel, cloisters, quadrangle, and other buildings of the 14th century still used by the 70 scholars. Around are newer buildings and the 10 houses in which live the commoners, about 400 in number. Classics are the chief subject of study, but mathematics, science, and modern languages are also taught. Winchester boys call themselves Wykehamists. The school motto is *Manners Maketh Man*. Sir

Herbert Baker designed a notable memorial of the First Great War. See St. Catherine's Hill.

Winckelmann, JOHANN JOACHIM (1717-68). German art

critic. Born at Stendal, Saxony, Dec. 9, 1717, he studied theology, medicine, and mathematics, and in 1754 secured a librarian's appointment at Rome, where he devoted himself to the study of antiquities. The result was his *History of Ancient Art*, 1764, which gained him a cosmopolitan reputation. The first to describe the objects of art at Pompeii and Herculaneum, Winckelmann became superintendent of antiquities at Rome, but he was robbed and murdered at Trieste, June 8, 1768.

Winckler, Hugo (1863-1913). German Orientalist. Born at Gräfenhainichen, Saxony, July 4,

J. J. Winckelmann, German art critic

1863, he studied in Berlin, and attained the university chair of Oriental languages and history, 1904. He excavated Boghazköi, in Cappadocia, 1906-07, discovering a cuneiform version of the *Rameses-Hittite treaty*, two temples, and many inscribed tablets, some since identified as Hittite. There is an Eng. trans. of his *History of Babylonia and Assyria*, 1907. He translated the *Tell el-Amarna letters*, 1896; the *Code of Hammurabi*, 1904; and made contributions to O.T. study. He died in April, 1913.

Wincoal. Low powdered permitted explosive, which gives rise to a large spreading effect, and at the same time reduces shattering, thus giving good quality coal. It is claimed that safety in the presence of fire-damp is increased with this class of explosive. The composition is 13-16 p.c. partly gelatinised nitroglycerine, 29-35 p.c. ammonium nitrate, 11-17 p.c. sodium nitrate, 3-5 p.c. wood meal, 36-39 p.c. sodium chloride. See *Permitted Explosives*.

Wind. Horizontal movement of air over the earth's surface, specified by its speed and the direction from which it blows. Near the ground the wind speed is generally expressed in knots, m.p.h., etc., or as a force on the Beaufort scale (see *Gale*), and in the free air in units of speed only; the direction is always understood as that from which it blows, and is expressed in compass points or in degrees measured from true North, e.g. E. = 90°, S. = 180°, W. = 270°. The habit of naming local winds according to their character, or some peculiarity associated with the direction from which they blow, has persisted to the present time, chiefly in the Mediterranean, where occur the Bora, from the N.; the *Levanter* and *Ponente*, from the direction respectively of the rising and setting sun; the *Gregali*, from Greece; the *Mistral*, the master wind; and the *Sirocco*, the hot southerly wind.

The force or speed of the surface wind is measured by means of an anemometer (*q.v.*). Direction recording is either directly or remotely from a wind vane. During and after the Second Great War radar superseded tracking pilot balloons with theodolites as a means of measuring upper winds. The speed of a steady wind can be measured by the force or pressure which it exerts on a plane surface at right angles to it. Experiments have shown that, for a circular

plate of about one sq. ft. in area and for air of normal density, $P = 0.003v^2$, where P is the pressure in lb. per sq. ft. and v the velocity in m.p.h. The relationship between mean wind speed, in m.p.h., and Beaufort force (F) is given by $v = 1.87 \sqrt{F^3}$.

In the British Isles, where continuous records of wind are available at nearly 50 meteorological stations, the average velocity over a period of one hour has rarely, if ever, exceeded 70 m.p.h., although gusts of 100 m.p.h. and upwards have been recorded. Gusts, i.e. short-period fluctuations resulting from interference by irregularities of the surface over which the air is flowing, are to be distinguished from squalls, sudden blasts of wind due to some meteorological cause and lasting usually for a few mins. before dying away as suddenly as they begin. Speeds greater than that of a hurricane have been recorded at the earth's surface, the greatest being 231 m.p.h. at a height of about 6,000 ft. on Mount Washington, U.S.A., on April 12, 1934.

Estimation of Wind Force

The estimation of the force of the wind, for meteorological purposes, is exceedingly difficult, since the wind at a particular place is never steady, but blows in a series of gusts and lulls with accompanying fluctuations of direction. In fact, the atmosphere may be regarded as usually in a state of turmoil, with hills, trees, houses, etc., obstructing the motion of the air, which often develops into eddies of varying size (see *Turbulence*). Thus the variation of wind in the lowest layers is governed by the turbulent interchange of momentum between the surface air and that sufficiently high (roughly 2,000 ft.) to be outside the influence of surface friction. As the various effects which wind produces locally during its travel, e.g. movement of trees, banging of doors, raising of waves on the sea, all dissipate some of its energy by converting it from a steady flow into eddy motion and ultimately into the irregular motion of heat, the speed of the wind generally increases rapidly with height until the undisturbed wind of the free air is reached. This rate of increase depends upon the extent of mixing, or turbulence, of the surface and higher layers, and is most marked when the mixing is least.

The effect of surface obstacles is well illustrated by a comparison of anemograph records on the roof

of the Air Ministry in London, and at the Bell Rock lighthouse, which has an open exposure to the sea in all directions. The latter records are by far the steadier; the gusts and lulls, being much less prominent, give the traces a narrower appearance. Above 2,000 ft. or so the variation of wind with height depends upon the variation of the pressure gradient with height, which, in turn, depends upon the distribution of temp.—determining the density and hence the pressure of the air.

At many land stations there is a well-marked tendency for the wind to increase in speed and veer (in the N. hemisphere) during the morning and afternoon, and decrease and back towards evening. This rise in speed is due to the increased mixing of the layers of air, caused by the heating up of the land and the resulting convection: momentum is thus transferred from the upper layers to the surface. The diurnal variation vanishes in cloudy weather, and at other times may be masked, e.g. by changes in the general pressure distribution. On the coast the effects of land and sea breezes introduce complication. Up to certain limits the upper wind is subject to a variation which is the reverse of that at the surface, since the momentum gained by the surface air during the daytime comes from the upper air. At the top of the Eiffel Tower (1,000 ft.) there are falls in wind speed in the middle of the day of about 5 m.p.h. in Jan. and 8 m.p.h. in July, compared with rises of about 2 m.p.h. and 4 m.p.h. respectively near the base.

The primary cause of wind is the differences in solar and terrestrial radiation, which set up irregularities of temp. and give rise to convection currents. The air is forced to move by gravity, sometimes working through the agency of pressure difference. Although at any place the wind is never constant in either speed or direction, there is a pronounced tendency for it to blow most frequently from one direction. These prevailing winds over the earth constitute a general circulation. In equatorial regions there is a belt, the doldrums, where low pressure calms, and light, variable winds are experienced. Towards this belt two great sets of winds blow from the horse lats, high pressure calms located about 30°-50° N. and S. of the equator. These are the trade winds, which blow equatorwards from the N.E.



Windermere, Westmorland, England. A remarkable air photograph of the lake taken by the infra-red process

in the N. hemisphere and from the S.E. in the S. hemisphere. From the horse lats. other winds, the westerlies, blow polewards. N. of the equator these are the south-westerlies; in the S. hemisphere they blow from the N.W., and are called the roaring forties or brave west winds, owing to their persistence in about lat. 40°. The monsoon winds are seasonal in character, the S.W. monsoon bringing rain to India in summer, whereas the N.E. monsoon is cool and dry. Various local winds, e.g. whirlwinds and tornadoes, hurricanes and cyclones, katabatic winds, e.g. Bora, and land and sea breezes, are superimposed upon this circulation. See Meteorology; Monsoon; Trade Winds.

A. J. Drummond, F.R.Met.S.

Wind Action. In geology, the action of wind in eroding, transporting, and depositing material. Wind in desert regions forms a natural sand-blast which is capable of wearing away and polishing out-cropping rocks. Soft beds and zones of fracture or weakness are particularly susceptible to this attack; and differential weathering, in which more resistant rock stands out and weak rocks, etc., are fretted away, is highly developed. Hence rock exposures are often fantastically carved. Undercutting of rock masses is common because the main movement of wind-driven sand is near the ground. Undercutting of loose rock fragments causes them to tip over after a time, thus exposing fresh surfaces to the sand-blast.

Wind is directly responsible for the deposition of sand in dunes of various types. Light material is carried in air in suspension, and may be transported right out of the desert region as fine dust clouds. Such dust is later deposited as loess. Wind action is inhibited by vegetation, especially by grass,

which is sown extensively to prevent movement of dunes. Destruction of such protective covering has occurred in central U.S.A., Australia, E. Africa, etc., through excessive ploughing, monoculture, over-stocking of the land, fire, and other causes which allow wind action to work on the loose fine-grained soil, removing it from one region, leaving barren, stony ground behind, and depositing it elsewhere to suffocate crops. See Desert; Dune; Dust Bowl; Geology; Loess; Soil Erosion.

Windage. Term in gunnery for the leakage of propellant gases between the sides of the projectile and walls of the bore in rifles, guns, or cannon. Shell for use in cannon are fitted with driving bands, frequently constructed to form special gas-checks.

Windau. German name of the Latvian town Ventpils (q.v.).

Windaus, ADOLF (b. 1876). German chemist, born in Berlin on Christmas day, 1876. At school and university there, and at Freiburg, he first studied medicine, later chemistry. From 1915 he was professor and director of the general laboratory at Göttingen. His research work concerned cholesterin, stearines, glycosides, and from 1925 vitamins; he produced synthetically the anti-rachitic vitamin D. In 1928 he was awarded the Nobel prize for chemistry and the Pasteur medal.



Windhoek, S. W. Africa. General view of the town and capital of S. W. Africa

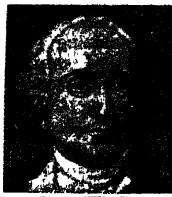
Windermere. Largest lake in England, lying wholly within Westmorland. Its length is 10½ m., and it covers nearly 6 sq. m., but does not exceed 1 m. in width. The places on its banks include Lakeside, at the foot, where the rly. touches it, Waterhead at the other end, and Bowness in the middle. Various short streams flow into it, and its waters flow by the Leven to Morecambe Bay. Steamers ply regularly on the lake. See Lake District.

Windermere. Urban dist. of Westmorland, England. On the E. shore of the lake, 4 m. S.E. of Ambleside, it has a rly. station, adjoins Bowness, and is the starting-place for excursions round the lake. It was called Birthwaite before the opening of the rly. The Church of St. Martin contains good 15th century stained glass and ancient paintings. Pop. 6,451.

Windfall. Anything blown down by the wind, such as fruit from trees. In English law, windfalls are trees, other than fruit trees, blown down by the wind. They belong to the landlord, unlike timber, which is the property of the tenant.

Windflower. Popular name for the wood anemone (*Anemone nemorosa*). See Anemone.

Windham, WILLIAM (1750-1810). British politician. Born May 3, 1750, and educated at Eton



William Windham, British statesman

and University College, Oxford, he became in 1783 secretary to the lord-lieutenant of Ireland. He was elected Whig M.P. for Norwich, 1784, and retained that seat for

18 years. A staunch follower of Pitt, he became secretary at war, with a seat in the cabinet, 1794-1801, and in 1806 was secretary for war and the colonies in Grenville's All the Talents ministry. He died June 4, 1810. *Consul* his Diary, 1784-1810, ed. Mrs. H. Baring, 1866.

Windhoek. The capital of South-West Africa. It is connected by rly.

with Walvis Bay, which lies 170 m. to W. The Germans made it the capital of their protectorate, and it remained so until entered by S. African forces, May, 1915. In Windhoek are govt. buildings, an

R.C. cathedral, and a Lutheran church; parks, gardens, and hot medicinal springs. Around Windhoek is pastoral country, with silver, copper, lead, and salt deposits. Pop. 18,770 (incl. 5,000 whites).

Wind Instrument. In music, instrument in which the vibrations are excited by the player's breath. They may be broadly classified as (1) Flute (flute, piccolo, flageolet, etc.), in which the air is directed against that part of the instrument known as the lip; (2) Reed (oboe, bassoon, clarinet, saxophone, etc.), instruments fitted with reeds, single or double; (3) Brass (trumpet, horn, trombone, cornet, etc.), in which the player's tensed lips act as reeds.

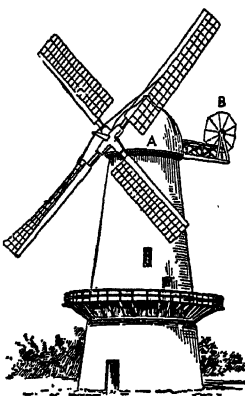
Wind in the Willows, THE. Nature story by Kenneth Grahame, first published 1908. It personifies various wild animals, led by the wandering Mole, the resourceful Water Rat, the gruff but kindly Badger, and the scatter-brained boastful Toad. Besides being a children's favourite (it was written for the author's son, killed in a rly. accident at 20), it is in graceful prose, rising to heights in a chapter on Pan. A. A. Milne made a dramatised version as *Toad of Toad Hall*, 1930, and the adventures of Toad were made into a Walt Disney cartoon film, 1950.

Windlass. Device for hoisting or hauling. It is used for raising weights, lifting water from a well, or on shipboard for raising the anchor. A common and simple form consists of a horizontal barrel for the hauling rope, supported in vertical standards, and rotated by a cranked handle. *See* Winch.

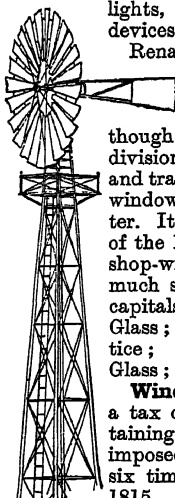
Windmill. Mill operated by the wind. Large windmills have four, five, or six arms, 20–50 ft. long, carrying sails. A sail may be canvas-backed by a wooden lattice attached to the arm, or a series of wooden slats arranged transversely. The old-fashioned post mill, which revolved as a whole on a central vertical pivot, embedded in a masonry base, has been superseded by the tower mill, with a fixed body and a revolving top. In this latter type the sails are kept square to the wind automatically by a fantail at the rear, driving the top through gearing. The sail-shaft, inclined upwards at an angle of about 10° to the horizontal, has a large toothed wheel on its back end, engaging with another wheel on the vertical shaft of the mill, or, if the sails drive a pump, on a secondary crank-shaft.

Excepting those used for draining fens, pumping windmills are

generally of the American or annular type. The wind wheel has a number of curved sheet-metal vanes set closely together on two rungs attached to the arms of the wheel, the combined



Windmill. Left, tower type in which revolving top (A) is turned by fantail (B) to keep sails in the wind. Right, American or annular type, used for pumping



projected area of the vanes being two-thirds or more that of the tip circle. The wheel-shaft revolves in plain or ball bearings in a rotating head pivoted centrally on a light wooden or steel lattice tower. A reduction gear and crank-shaft transmit power to the pump-rod.

Windmill Theatre. London playhouse, in Great Windmill Street, W.1. It was opened Feb. 4, 1932, under the ownership of Laura Henderson (d. 1944), with Vivian Van Damme (later proprietor) as producer and general manager. It became celebrated for continuous variety programmes entitled *Revuedeille*, consisting of six performances daily, with a change of programme every six weeks. Throughout the Second Great War the theatre, which seats 320, lived up to its slogan, "We never closed."

Window (old Norse *vindauga*, wind-eye). In a building, an opening in the wall for the admission of light and air; in modern usage, such an opening filled with glass.

Tracery enormously enhanced the importance of the window as an architectural feature, and the traceried window developed rapidly to its first climax, about the middle of the 13th century. From being a narrow slit in the wall, the Gothic window rapidly increased in width, and as the needs of private houses asserted themselves in addition to those of churches, the single fixed light gave place to elaborately fitted

casements with leaded panes. By the end of the 14th century immense windows, divided into many lights, gave opportunity for new devices of tracery.

Renaissance influences in the 16th century asserted the square-headed type as the only one for Europe, though during the Tudor period the division of lights by mullion (*q.v.*) and transom (*q.v.*) gave the British window a purely national character. It was not before the middle of the 19th century that the large shop-window of plate-glass was much seen in the great European capitals. *See* Clerestory; Dormer; Glass; Gothic Architecture; Lattice; Rose Window; Stained Glass; Tracery.

Window Tax. In Great Britain, a tax on windows in houses containing more than six. It was first imposed in 1695, and was increased six times between that year and 1815. Some reduction was made in 1823, and the tax was repealed in 1851. To escape payment people often bricked up their windows; such closed windows are to be observed in many old houses.

Windpipe. Part of the air passage situated between the larynx and the bronchi. *See* Trachea.

Wind River. Mountain range of the U.S.A., in the W. of Wyoming. A division of the Rocky Mountain system, it trends N.W. to S.E. and forms a watershed of rivers flowing to the Pacific and Atlantic basins. Many of its summits reach above 13,000 ft., Fremont Peak, the loftiest, attaining 13,790 ft.

Windrush. River of Glos and Oxon, England. It rises in the Cotswolds, E. of Winchcombe and W. of Moreton-in-the-Marsh, and flows in a S.E. course to join the Thames below Standlake. Its length is about 38 m. Well-known towns upon its banks are Bourton-on-the-Water, Witney, and Burford.

Windscreen. Transparent panel in front of the driver on a motor vehicle which gives protection from the elements and allows the driver and passengers to see the road ahead. It is so called because on the open bodies of early cars it was in fact merely a screen projecting upwards from the body. Nowadays it forms the front panel extending from the scuttle to the front rail of the roof. Glass must by law be unsplinterable, and is usually carried in a metal frame hinged at the top so that it can be opened, though it may be a fixed panel. To ensure visibility in fog hot air is led from the car heater close to the surface of the glass.

WINDSCREEN WIPER. To ensure that the glass of the windscreen is kept clear of rainspots or snow, there is provided a thin rubber blade with a metal backing, which is pivoted to a moving arm. The arm is attached on the end of the spindle, which is given a reciprocating motion through suitable gears from a small electric

and was anciently known as Windlesore, Wyndeshour, or Wynd-sore, i.e. winding shore. Edward the Confessor, who had a palace here, presented the surrounding land to the abbot of Westminster, from whom it was obtained, in exchange for some lands in Essex, by William I. Remains of ancient buildings, supposed to be part of the Confessor's palace, were discovered in 1919.

Windsor. Town of New South Wales, Australia. It stands on the Hawkesbury river 34 m. by rly. N.W. of Sydney. The state agricultural college is near here. Pop. 3,360. Another Windsor is a suburb of Brisbane.

Windsor. Town and river port of Nova Scotia, Canada. It stands at the mouth of the Avon, where it falls into Minas Basin, in Hants co., 46 m. N.W. of Halifax, and is the junction of the Midland rly. with the Dominion Atlantic rly. Its industries include shipping. Much gypsum is found in the locality. Here is King's College (q.v.). In 1919 the business part of the town was destroyed by fire. Pop. 3,436.

Windsor. City and lake port of Ontario, Canada. It stands on the Detroit river, just opposite Detroit, U.S.A., in the extreme S.W. of the prov., 228 m. S.W. of Toronto. It has stations on the C.N.R., the C.P.R., Michigan Central, Wabash, and Pere Marquette rlys., has electric rly. in the streets, and is connected with Detroit by the Ambassador Bridge and a tunnel under the river and a steam ferry on it. Steamers go from Windsor to the ports on the Great Lakes and the St. Lawrence. The industries, for which electric power is derived from Niagara, include making motor cars, paint, machinery, iron and steel goods, flour, and bricks. The pop. of 105,311 makes it the eighth biggest city in Canada.

Windsor. Family name of the royal house of Great Britain. The royal family (q.v.) belongs, by virtue of the marriage between Victoria and Albert, to the German family known as the house of Saxe-Coburg-Gotha, itself a scion of the family of the dukes and kings of Saxony, known also as that of Wettin. On July 17, 1917, George

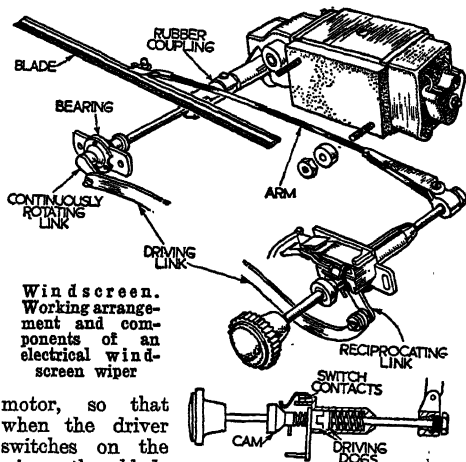
V by proclamation declared that henceforward his family should be known as "the house and family of Windsor." By the birth of a son to Princess Elizabeth in 1948 it became probable that she would be the last sovereign of that house and her successor the first of another.

Windsor, EDWARD ALBERT CHRISTIAN GEORGE ANDREW PATRICK DAVID, DUKE OF (b. 1894). British prince, formerly Edward VIII, king of Great Britain and Northern Ireland and the British overseas dominions, emperor of India. He was born at White Lodge, Richmond Park, Surrey, June 23, 1894, eldest child of the duke and duchess of York, afterwards King George V and Queen Mary. He was a naval cadet at Osborne from 1907 and at Dartmouth from 1909. On his father's succession to the throne, 1910, he became duke of Cornwall, and on his 17th birthday was invested at Carnarvon Castle as prince of Wales, being created K.G. the same year. In 1912 he entered Magdalen College, Oxford. Gazetted to the Grenadier Guards on the outbreak of the First Great War, he was soon, in deference to his ardent desire for service overseas, appointed A.D.C. to Sir John French, and was frequently under fire on the western front. He served on the staff of the Mediterranean Expeditionary Force in Egypt, 1916; on the Italian front, 1917-18; and with the Canadian corps in 1918.

After the war he undertook a series of imperial and world tours which were a marked personal success as well as of considerable practical value in cementing the bonds of empire. The most important were to Canada, 1919; Australia, New Zealand, West Indies, 1920; Malta, India, Ceylon, and Far East, 1921; Africa and S. America, 1925; Canada again (with Stanley Baldwin, the prime minister) for the 60th anniversary of the founding of the dominion, 1927; E. Africa (with the duke of Gloucester), 1928, a tour cut short by his father's critical illness; E. Africa again, 1930; Argentina, 1931. Everywhere his remarkable personal charm and his obvious preference for informality brought an enthusiastic reception. In



Royal House of Windsor arms



Windscreen. Working arrangement and components of an electrical windscreen wiper

motor, so that when the driver switches on the wiper the blade sweeps a wide arc on the glass immediately in front of him. Another form of wiper is actuated by a simple pneumatic device connected by a small bore tube to the induction system of the engine so that suction causes a piston to move to and fro.

Windsor, N.W. Royal and mun. bor. and market town of Berks, England. On the right bank of the Thames, 22 m. W. of London, it is served by rlys. and is a Green Line bus terminus. It is connected by bridges with Eton and Datchet.

Once a chapelry of Clewer, Windsor was made a free bor. and given a market by Edward I. Its buildings include the town hall, completed by Wren, 1686; parish church of S. John the Baptist, rebuilt 1822, interior remodelled 1869; garrison church of Holy Trinity, 1842; royal mews; and a museum with Shakespeare relics. Windsor gives its name to a co. constituency. The castle (including its Great Park) is separately described. Market day, Sat. Pop. 19,940. Consult Annals of Windsor, R. R. Tighe and J. E. Davis, 1858.

Windsor, O.R.D. Village of Berks, England. It is 2 m. S.E. of the town and castle of the same name,

Canada he purchased and stocked his own ranch.

At home, in addition to the unending routine functions demanded of royalty, he identified himself especially with the views and needs of his fellow ex-Servicemen, becoming president of the British Legion and also closely associated with Toc H. Secondly, and even more notably, he showed a great understanding of, and human sympathy with, the growing mass of unemployed workers and slum dwellers. His more personal pursuits revealed him as a prince with tastes in sport, recreation, and entertainment akin to those of most of his generation.

He became king on the death of his father, Jan. 20, 1936. No man ever succeeded to the throne at a higher level of popular esteem or aroused greater expectations.

But his reign was to be one of the shortest in British history. It ended with his abdication, Dec. 10, 1936 (to take effect from the next day), in order to be free to marry the woman of his choice. This was Mrs. Ernest Simpson, an American with whom he had been friendly for some years. When the king went on a private holiday cruise in the Adriatic during the summer, she accompanied him. Later in the year she divorced her husband, as she had divorced a previous husband. The British press was aware of this friendship but made no mention of it. The U.S. press, far less reticent, eventually announced that the king would marry Mrs. Simpson. On inquiry, the prime minister, Stanley Baldwin, was told by the king that this was true. Knowing that a woman who had been twice previously married was unlikely to be accepted by the U.K. or the dominions as a queen consort, the king sought an opinion on the possibility of a morganatic marriage by which she might be his wife but not queen. But such a position was unrecognized in the constitution, and he was therefore faced with the alternative of renouncing Mrs. Simpson or renouncing the throne. He chose the latter, explaining in a broadcast immediately after the abdication: "I have found it impossible to carry the heavy burden of responsibility and discharge my duties as king as I would wish to do without the help and support of the woman I love."

The most significant event of the short reign of this king who was never crowned was his visit to the distressed areas of the S. Wales coalfields. Appalled by the con-

ditions in which unemployed miners were living, he gave them the promise: "Something will be done." But the abdication intervened.

He was succeeded by his brother George VI, who at once created the ex-king duke of Windsor. The duke left the country immediately after his broadcast and lived privately in Austria and France until his marriage, June 3, 1937, a private ceremony, at Tours, France. He did not visit Great



H.R.H. the Duke of Windsor, formerly King Edward VIII, and the Duchess of Windsor

Britain again until just after the outbreak of war in 1939, when he volunteered for army service, and was attached to the staff of the B.E.F. with the rank of major. From 1940 to 1947 he was governor of the Bahamas.

The duchess of Windsor was born at Baltimore, Maryland, in 1896. As Bessie Wallis Warfield she was married in 1916 to E. W. Spencer, a U.S. naval officer, whom she divorced 1925. She came to England in 1926; and was married 1928-36 to Ernest Simpson, a shipbroker. In 1937 she reverted to her maiden name of Warfield. Her marriage to the duke of Windsor did not entitle her to the style of H.R.H. Consult King Edward VIII, his Life and Reign, H. Bolitho, 1937; Edward VIII, Duke of Windsor, B. Maine, 1937; His Was the Kingdom, F. Owen and R. J. Thomson, 1937; The Duchess of Windsor, E. H. Wilson, 1937; The Windsor Tapestry, C. Mackenzie, 1938.

Windsor Castle. Royal palace of England. Situated on an eminence overlooking the valley of the Thames and the town at its base, it covers, with its grounds, about 12 acres, and is divided into a lower ward, middle ward, and upper ward or quadrangle. In the centre is the Round Tower or Keep; the state and private apartments are on the N.E. and E.

Founded by William I on the site of an earlier fortress, and largely rebuilt and added to by William of Wykeham for Edward

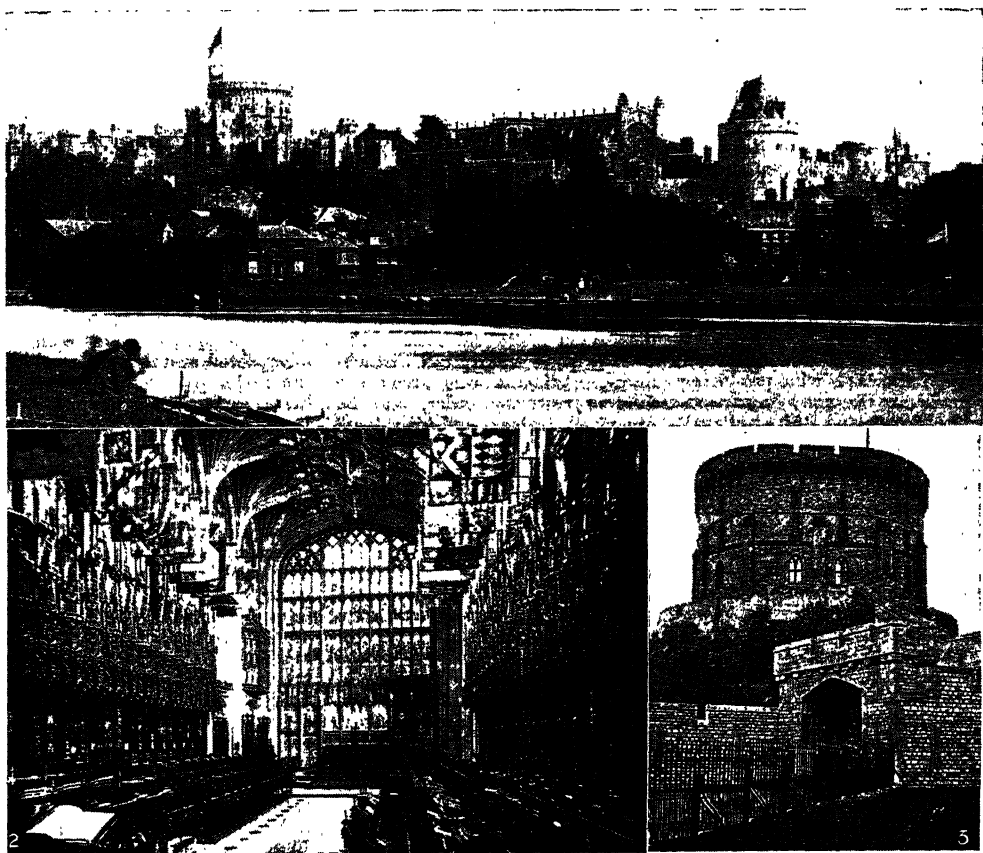
III, Windsor Castle was extended and renovated by George III and IV and Victoria. S. George's chapel, a beautiful example of Perpendicular Gothic, was begun by Edward IV and completed by Henry VIII, who was buried here, as were Jane Seymour, Charles I, George III, George IV, William IV, Edward VII, and George V. In the choir, separated from the nave by a modern altar screen, are the stalls and insignia of the knights of the garter. The vaulting of the chapel, a building 232 ft. long by 66 ft. wide, is fan-shaped. The Albert memorial chapel, built by Henry VII, was converted into a memorial of the prince consort.

The residential parts of the castle, library, etc., form a rich storehouse of artistic and other treasures. An unusual feature is Queen Mary's Doll's House (see Doll's House). The Round Tower dates from the time of Edward III. In the Home Park, lying N. and E., and about 4 m. in circumference, are Frogmore (q.v.) House, dairy, and Shaw Farm. The Great Park lies to the S.; its Long Walk runs in a straight line for nearly 3 m. in the direction of Virginia Water (q.v.). Farming of much of its 1,800 acres began in the Second Great War, and when it was decided to continue this practice the famous herd of fallow deer founded by Charles II had to be dispersed, 1950. In the park is Royal Lodge. Consult Romance of Windsor Castle, H. Bolitho, 1947.

Windsor Forest. A hunting ground of William I, a fragment of which still exists on the W. side of Windsor Great Park, Berks. Said originally to have been 180 m. in circumference, it was deforested in 1814.

Wind Tunnel. Structure of tubular form in which models (or actual aircraft) are subjected to artificial winds. The first apparatus of the kind was built by the Wright brothers.

Windward Islands. Southern division of the Lesser Antilles, West Indies. They comprise the British colonies of Dominica, St. Lucia, St. Vincent, Grenada, and the Grenadines (half under St. Vincent and half under Grenada), forming the E. barrier to the Caribbean Sea, between Guadeloupe and Trinidad. Though the Windward Islands form one group under a governor and commander-in-chief, each island has its own institutions, laws, revenue, tariffs, etc. They have a common court of appeal and unite for certain other common purposes. Sugar, cocoa,



1. General view from the left bank of the Thames, showing (L. to R.) the Round Tower, S. George's Chapel, and the Curfew Tower. 2. Interior of S. George's Chapel, with the stalls of banners of the Garter knights. 3. The Round Tower and S. George's Gateway

WINDSOR CASTLE: FOR EIGHT CENTURIES THE HOME OF ENGLAND'S SOVEREIGNS

rum, spices, cotton, arrowroot, and timber are the chief products. The total area is about 800 sq. m. Pop. 262,000, mostly negroes. See West Indies; also islands named.

Wine. The fermented juice of fresh grapes gathered and pressed in their country of origin. Ancient civilizations such as the Egyptian, Assyrian, Greek, and Roman had a knowledge of wine. The vine is indigenous to a number of countries where there is sufficient sunshine to bring its fruit to maturity.

To make wine the grapes should be harvested when perfectly ripe and dry, then crushed so as to express the juice. The pressing is done either by treading or by a machine (called in France a *fouloir-égrappoir*). Grapes contain some 98 p.c. of water and sugar, the proportion being nearly four times more water than sugar, and two p.c. of various salts, acids, and other substances, with no evidence whatever of alcohol. The juice of the grape is drained off after the

treading or pressing. An operation termed (in France) *débourbage* follows and consists of separating all impurities from the must before fermentation. These impurities are, usually, the débris of the skins, pulp, pips, etc., and dust or injurious matter of any kind.

Grape juice at first becomes turbid or turbid. In a rising temp., it forms carbon dioxide (carbonic acid gas), which escapes so that the juice, or must, seems to be boiling or effervescing. At this stage it consists of about 90 p.c. water and 10 p.c. alcohol. Pasteur showed that fermentation requires the presence of microscopic living organisms or "yeast." A certain species of these organisms called *Saccharomyces ellipsoideus* lives on grape juice. It forms the bloom on ripe or ripening grapes freshly gathered in suitable weather, and exists in tremendous numbers on the skins. It sets to work directly the grapes are pressed and the juice is running out, and turns

must into wine. Rain washes off *Saccharomyces*, hence in rainy seasons the must is generally not sufficiently activated and poor wine results.

Fermentation, or vinification, is a process of chemical change. It will take place in open or closed vessels, wooden vats and sometimes glass-lined cement vats or tanks being generally used. In the making of red wines the skins are allowed to remain in the must. White wines can be made from white grapes or from black grapes having white juice, or both, but no red wine can be made from white grapes. The skins of black grapes, which contain the colouring matter, are not allowed to remain in the must for white wines.

The conservation of a dry white wine differs little from that of red wines. The period before maturity is reached differs according to the wine. Tartaric acid is present in all wines made from grapes. The astringent principle is tannin, more

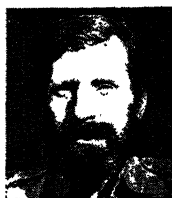
especially in red wines. A well-made wine should contain sufficient tartaric acid and tannin. If a wine is bottled whilst it is fermenting, the carbonic acid gas will try to escape unless the corking is sufficient to hold it in the wine. When the bottle is opened and the wine poured out, it will, if properly made, form a *mousse*, i.e. it bubbles, as the gas leaves the wine and escapes into the atmosphere. Both still and sparkling wines can be made out of almost all varieties of grapes. France, in normal years, produces more than a third of all the wine produced in Europe. Other important wine-producing countries are Germany (in particular the Moselle and Rhine valleys), Spain (notably sherry), Portugal (port), Italy (chianti, barolo, lacrima Christi, and many wines in small quantity which are unknown abroad), Hungary (Tokay), Algeria, S. Africa, California, and Australia. See Bordeaux; Burgundy; Champagne; Claret; Hock; Moselle; Port; Sherry, etc. *Consult* Notes from a Cellar Book, G. Saintsbury, 1920; Handbook of Wine, W. J. Todd, 1922; Wine and Wine Lands, F. Hedges Butler, 1926; Encyclopaedia of Wine, A. L. Simon, 1946.

Wing. Organ of flight in bats, birds, and insects. In the bats it consists of an extraordinary lengthening of the finger-bones, over which, when outspread, is stretched a web of skin, which is continued backwards to include the hind legs from the ankle upwards and the greater portion of the tail. In the bird the fore-limb is lengthened, certain bones are united, and only three of the fingers are represented. The movements of the wing are controlled by powerful muscles attached to the keeled breast-bone. In insects, wings are not modifications of limbs; they consist of thin horny membranes, variously strengthened by ribs or network of firmer material, and may be naked or covered with minute scales or hairs. There are usually two pairs, but in flies (Diptera) there is one.

Wing. Operational division of the R.A.F. It normally consists of three squadrons of aircraft of a specific type; fighter, bomber, or transport. For administrative purposes and at training schools, personnel at air stations are divided into wings.

Wingate, ORDE CHARLES (1903-44). British soldier. Born Feb. 28, 1903, he was educated at Charterhouse and Woolwich and commissioned in the Royal Artillery in 1923. After service with the

Sudan defence force, 1928-33, during which he became fluent in Arabic and gained a profound



O. C. Wingate,
British soldier

knowledge of Middle East affairs, he was promoted captain in 1936 and sent to Palestine and Transjordan. The mufti of Jerusalem was supporting bands of disaffected Arabs and Syrians who were causing widespread disturbances. Wingate was given the task of restoring order, and he organized, trained, and led a force of Jewish volunteers. By 1938 he had restored order in the area of the oil pipe-line and on the N. frontier; and was awarded the D.S.O.

At the outbreak of the Second Great War, he was commanding an A.A. battery in Kent, but at the request of Gen. Wavell was posted to the Middle East and successfully commanded a force of guerrillas raised to assist the Allies against the Italians in Abyssinia (see East Africa Campaign). During the retreat from Burma early in 1942, Wingate, again at Wavell's request, raised guerrillas there. The long-range jungle force he built up was the strategic conception upon which the ultimate Burma campaign was based. Wingate's presence in Burma, and the nature of his operations, were among the best kept secrets of the war; not until May, 1943, was any official statement released. It was then announced that his force, called Chindits, had arrived in India from N. Burma after spending three months as wreckers in Japanese-controlled territory.

Consisting of British and Gurkha columns with intelligence and reconnaissance units from the Burma Rifles, Wingate's force penetrated hundreds of miles across jungles and valleys. The rivers Chindwin and Irawadi were crossed and the Myitkyina rly. was cut in some 80 places. Skilfully infiltrating through the chains of Japanese outposts and garrisons, the force operated as far as the Shan States.

Wingate made a great personal impression on Winston Churchill, who took him, still clad in his jungle drill, to the Quebec and Washington conferences of 1943. There he met Lord Louis Mountbatten, who encouraged his ideas and promised unlimited support. In March, 1944, a second Chindit expedition,

on a much larger scale, went into Upper Burma under Wingate, promoted maj.-gen. Soon after 12,000 men had been successfully planted in the heart of Japanese-occupied territory, Wingate was killed in an aeroplane accident, March 24, while visiting forward positions held by his raiders between Silchar and Imphal. In 1947 his body was recovered and buried with military honours.

Wingate based his operations on the assumption that Japanese troops were methodical; he always presented them with the unexpected, and that policy played the major part in the success of his two expeditions against them. In military outlook he combined the qualities of scientist and guerrilla; he was solitary, elusive, and without regard for orthodox military caution. He had extensive literary knowledge, and his military orders and proclamations invariably contained quotations from poetry and the Bible. See Chindits. *Consult* Wingate's Phantom Army, W. G. Burchett, 1947.

Wing Commander. Commissioned rank in the R.A.F. Its holder ranks immediately above a squadron leader and below a group captain. The insignia consists of three rings of equal width.

Wingfield Sculls. Sculling race which forms the English amateur sculling championship. Instituted in 1830, it is rowed annually in July on the Thames, from Putney to Mortlake, over a course of 4½ m. Best time is that of L. F. Southwood, 21 mins. 11 secs., in 1933. See Sculling.

Wingfield - Stratford, Esme Cecil (b. 1882). English historian. Born Sept. 20, 1882, he went from Eton to King's College, Cambridge, and in 1904 took a research post at the London School of Economics, being also a fellow of King's, Cambridge, from 1907. His special interests were reflected in many books, e.g. History of British Civilization, 2 vols., 1928; Victorian Sunset, 1932; King Charles and the Conspirators, 1937; Charles King of England, 1948.

Winifred OR WINEFRIDE (Welsh *Gwenfrewi*). Legendary Welsh saint and martyr. She is said to have lived in the 7th century, and to have been beheaded by Caradoc, son of King Alan, because she refused his suit. She is commemorated in the R.C. church on Nov. 3. See Holywell; St. Winefride's Well.

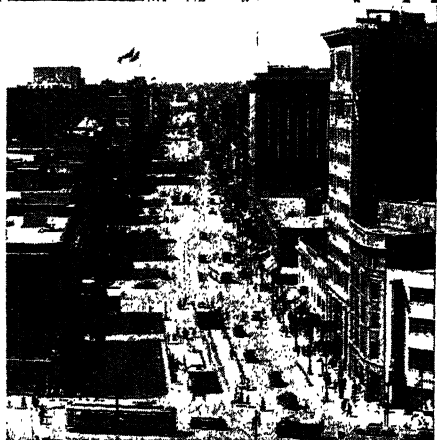
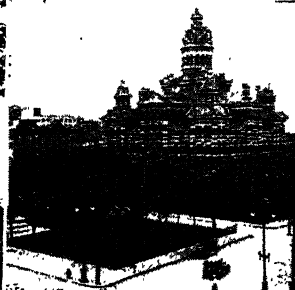
Winkelried, ARNOLD VON. Swiss national hero. At the battle of Sempach, July 9, 1386,

he is said to have gathered into his own breast the lances of several Austrian soldiers, so as to make an opening in their line for his attacking compatriots, and thus sacrificing his life. It was discovered in 1866 that an historical personage of the same name, commanding Swiss mercenaries at Bicocca, 1522, actually performed the sacrifice. See Sempach.

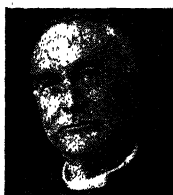
Winkle. Popular name for the edible marine snail, correctly called Periwinkle (*q.v.*).

Winkle, NATHANIEL. Character in Dickens's *Pickwick Papers*. One of Mr. Pickwick's constant companions in his peregrinations, he claims to be a sportsman, but incurs ridicule by his ludicrous failure to shine as rider, shot, or skater. The character was introduced as a concession to the original illustrator, Seymour, who had some reputation as a sporting artist, and whose original proposal for the work, made to the publishers, was that it should deal with the adventures of a Cockney sporting club.

Winnington-Ingram, ARTHUR FOLEY (1858-1946). British prelate. Born Jan. 26, 1858, and



Winnipeg, Canada. 1. The province of Manitoba's parliament building. At the right is a monument to Sir George Cartier. 2. City Hall. 3. Portage Avenue, principal business thoroughfare of the city, looking west from Main Street National Film Board of Canada



A. F. Winnington-Ingram, British prelate Russell

educated at Marlborough and Keble College, Oxford, he was first a curate of S. Mary's, Shrewsbury; private chaplain to the bishop of Lichfield, 1885-88; head of Oxford House, Bethna. Green, 1888-97. Rector of S. Matthew's, Bethnal Green, 1895-97, he was then bishop suffragan of Stepney and canon of S. Paul's until in 1901 he succeeded Creighton as bishop of London. Unconventional, sympathetic, tireless, and strong in his championship of social causes, Dr. Winnington-Ingram was one of London's most popular bishops. He resigned in 1939 and died May 26, 1946. His writings included *The Eyes of Flame*, 1914; *The Church in Time of War*, 1915; *The Potter and the Clay*, 1917; *Rays of Dawn*, 1918; *The Spirit of Peace*, 1921; *Some Recollections of a World Tour*,

1923. *Consult Life*, S. C. Carpenter, 1949.

Winnipeg. River of Manitoba, Canada. It flows as a turbulent, winding stream for 163 m. W. from Lake of the Woods to Fort Alexander, where it enters Lake Winnipeg.

Winnipeg. Lake of Manitoba, Canada. Area, 9,400 sq. m.; length, 260 m. It receives the Red river from the S., the Saskatchewan from the W., and other streams. It is a popular tourist resort. Lakes Manitoba and Winnipegosis send their waters down to Lake Winnipeg, whence the Nelson flows to Hudson Bay.

Winnipeg. Capital of Manitoba, and the fourth largest city in Canada. It stands on a plain at the junction of the Red river and the Assiniboine, is 1,414 m. W.N.W. of Montreal, and 60 m. from the U.S. boundary. It is the western

h.q. of the C.P.R. and the C.N.R. The Hudson Bay rly. to Churchill via Le Pas, built to carry wheat, reduced by 500 m. the route from Winnipeg to Liverpool.

The streets are wide and straight. The buildings include the city hall,



Winnipeg, Canada. Plan of the business quarter and central districts of the capital city of Manitoba

parliament buildings, general hospital, Tuxedo military hospital, Union station, colleges of the university of Manitoba, and many fine churches. Winnipeg is the great grain market of the west, and distributing centre for the prairie provinces. It has lumber yards, flour mills, foundries, and makes boxes, bricks, confectionery, vinegar, and aerated waters, while there are printing, lithograph,

and bookbinding establishments. Electric power for its industries comes from the Winnipeg river, and its water supply from Lake of the Woods. In May, 1950, in one of the worst floods in Canadian history, one-eighth of the city was inundated when the Red river rose some 30 ft. above normal level; 81,000 people were evacuated, and damage was estimated at over \$50,000,000.

Fur traders erected a trading post here before 1763, and early in the 19th cent. a more extensive one called Fort Garry was put up. Round this a group of houses sprang up after 1850 and, named Winnipeg, became a city in 1879. Fur auctions are still held regularly. Pop. 229,045.

Winnipegosis. Lake of Canada. In the S. of the prov. of Manitoba, it covers 2,080 sq. m. Various rivers, including the Mossy, Swan, and Red Deer, flow into it, while the Waterhen connects it to Lake Manitoba. Its greatest length is 130 m., its coastline c. 570 m.

Winnowing. Process of removing chaff and other impurities from grain and seeds by the action of a current of air. The work was at first left to the wind, but since about 1800 machinery has been used. See Agriculture.

Winona. City of Minnesota, U.S.A., the co. seat of Winona co. It stands on the Mississippi, about 100 m. S.E. of St. Paul, and is served by the Chicago, Milwaukee, and St. Paul rly. and other lines. About the wealthiest city for its size in the U.S.A., its industries have included lumber, shipping, brick making, wheat exporting, and meat packing. The dominant element is New England stock, with German settlers arriving later. Broad residential streets are lined with elms and maples; the grounds of colleges and religious institutions are designed as landscape gardens. Winona was settled four years before it became a city in 1857. Pop. 22,490.

Winsford. Urban dist. of Cheshire, England. It stands on the Weaver, 3½ m. W.S.W. of Middlewich, and has three rly. stations. It is a centre of the salt industry, the salt being carried by river to Liverpool. There are iron and steel works, while abrasives and clothes are made. Here are a guildhall, library, grammar school, and infirmary. At Over is the ancient church of S. Chad, while Vale Royal was once a Cistercian abbey. Pop. est. 11,640.

Winslow. Town of Bucks, England. Situated between Aylesbury and Buckingham, 10 m. N. by W. of the former, it is on the rly. from Oxford to Bletchley. Winslow is an agricultural town, formerly the centre of a lace-making industry. Pop. 1,532.

Winslow, EDWARD (1595-1655) Pilgrim father. Born at Droitwich, Oct. 18, 1595, he went to Leyden



Edward Winslow,
Pilgrim father

in 1617, returning to England three years later to sail in the Mayflower (q.v.). He was elected governor of Plymouth colony, 1633, 1636, and 1644. In 1623, 1624, and 1635 he sailed to England as agent for the colonists, and in 1646 again crossed the Atlantic, to defend them against a charge of religious intolerance. In 1655 Cromwell appointed him chief civil commissioner on the naval expedition to the West Indies, but Winslow died at sea on May 8. See Pilgrim Fathers.

Winslow Boy, THE. Play by Terence Rattigan. Produced at the Lyric Theatre, London, May 23, 1946, this piece followed closely the Archer-Shee episode of 1908. In the play a cadet at Osborne, accused of stealing a 5s. postal order, is expelled by the authorities; his father, ignoring ridicule, persuades an eminent barrister to proceed by petition of right to establish the innocence of his son, who is completely vindicated. The chief parts were taken by Frank Cellier, Angela Baddeley, and Emlyn Williams. In a film version directed by Anthony Asquith, 1948, they were played by Sir Cedric Hardwicke, Margaret Leighton, Robert Donat.

Winstanley, HENRY (1644-1703). English engineer. Born at Saffron Walden, March 31, 1644, he became clerk of the works to Charles II, 1666. In 1696 he designed the Eddystone lighthouse, and while engaged on erecting it was captured by a French privateer. On his release he continued the building, which he completed in 1700. The lighthouse was chiefly of wood, and in a storm on the night of Nov. 26, 1703, Winstanley lost his life in its total destruction. See Eddystone.

Winstler, REGINALD THOMAS HERBERT FLETCHER, 1st BARON (b. 1885). British politician. He

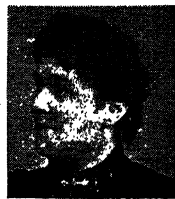
was born March 27, 1885, and after passing out of H.M.S. Britannia, entered the Royal Navy and served in the First Great War. Lieut.-Cmdr. Fletcher represented Basingstoke as Liberal M.P., 1923-24, but joined the Labour party in 1929, and sat for Nuneaton, 1935-41, being raised to the peerage in 1942. Minister of Civil Aviation in the Attlee govt. of 1945, he was appointed governor and c.-in-c. of Cyprus next year, but resigned in 1949 when he found that his efforts to secure acceptance of a new constitution for that island had proved unavailing.

Winston-Salem. City of North Carolina, U.S.A., the co. seat of Forsyth co. It is 112 m. by rly. W. of Raleigh. Two Moravian communities, settled in 1753, combined in 1913 to form the present city, which became the state's leading industrial centre. A first tobacco factory was opened in 1872, and cigarette and tobacco production has risen to an annual value of about \$750,000. Textile mills provide the second largest industry. Negroes, forming 42 p.c. of the pop. of 79,815, live chiefly in the older municipalities; wealthier whites in near-by Salem.

Winter. Fourth and last season of the year. In northern latitudes it extends astronomically from the winter solstice (about Dec. 21) to the spring equinox (about March 21). South of the equator winter corresponds to the northern summer. In Great Britain winter comprises Dec., Jan., and Feb.

Winter, JOHN STRANGE. Pen-name of Henrietta Eliza Vaughan Stannard (1856-1911), British novelist. She was born Jan. 13, 1856, at York, daughter of H. V. Palmer, rector of S. Margaret's. Educated at Bootham House, she began writing tales of military life quite young; her pen-name was taken from a character in her first book, *Cavalry Life*, 1881. In 1884 she married Arthur Stannard, and in 1885 published *Bootles' Baby*, which established her reputation. She died Dec. 14, 1911.

Winter Aconite (*Eranthis hyemalis*). Perennial herb of the family Ranunculaceae. A native of W. Europe, it has a stout creeping rootstock, from which arise the round, lobed leaves. The



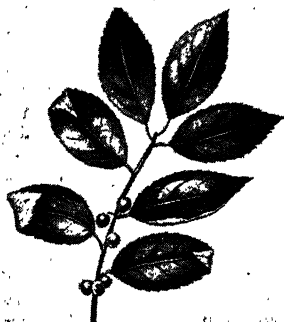
John Strange Winter,
British novelist



Winter Aconite. Rootstock, leaves, and cup-shaped flowers with bracts

flowers are solitary, pale yellow, and cup-shaped at the summit of a tall stem, with a couple of broad bracts below the flower. The plant flowers from Jan. to March.

Winter Berry OR **BLACK ALDER** (*Ilex verticillata*). Shrub of the family Aquifoliaceae. Found native in N. America, it grows to a height of six feet, and has alternate, long, lance-shaped leaves with toothed edges. The small white flowers are succeeded by red berries, about $\frac{1}{4}$ in. in diameter. The bark is bitter and has been used medicinally.



Winter Berry. Leaves and small red berries

Winterborne. First name of 17 villages in Dorset, England. They lie in the middle portion of the co., from W. of Dorchester to near Blandford. Winterborne Whitchurch was the birthplace of George Turberville; William Barnes was rector of Winterborne Came. It is to be noted that the variant spelling Winterbourne is used in Wilts and Glos.

Winter Cherry (*Physalis alkekengi*). Perennial herb belonging to the family Solanaceae, native of the Caucasus and China. It has a creeping rootstock and scarcely branched stems. The leaves are wedge-shaped oval on long stalks, and the calyx becomes enlarged, inflated, and red after the white corolla has dropped.

The fruit is a round edible berry of a scarlet colour, hidden in the bladder-like calyx.

Winter Garden Theatre. London playhouse in Drury Lane, W.C.2. Built on the site of the Middlesex music hall, it was opened May 20, 1919, under the management of George Grossmith and Edward Laurillard, the opening production being the musical comedy *Kissing Time*, which ran for 430 performances. The theatre became noted for musical pieces, the best-known of which included *Sally*, 1921; *The Cabaret Girl*, 1922; *Tip-Toes*, 1926; *The Vagabond King*, 1927; *It's Time to Dance*, 1943; *The Kid from Stratford*, 1948. Donald Wolfit appeared here in Shakespearian seasons during 1945-46. The theatre seats 1,800.

Wintergreen (*Pyrola*). Small genus of evergreen perennial herbs of the family Ericaceae. Natives



Wintergreen. Sprays of flowers and leaves of *Pyrola rotundifolia*

of Europe, Asia, and N. America, they have creeping rootstocks, from which grow most of the leathery leaves. The white, pink, or yellowish flowers are globular in form, and are mostly in sprays terminating the upright scapes.

Wintergreen Oil. Essential oil with a strongly aromatic odour obtained by distilling the leaves of *Gaultheria procumbens*. The oil is



Winter Cherry. Left, spray of flowers and leaves: right, fruit

also known as oil of gaultheria. It consists chiefly of methyl salicylate, which can be made synthetically by heating methyl alcohol and salicylic acid together in the presence of sulphuric acid.

Winterhalter, FRANZ XAVIER (1806-73). German painter. Born at Menzenschwand, Black Forest, April 10, 1806, he studied painting at Munich, and in 1828 moved to Karlsruhe, where his portrait of the grand duke Leopold established his fame. Settling in Paris



Franz Winterhalter, German painter

in 1834, he became the most famous portraitist of his time. His best-known works are impressions of Queen Victoria and the prince consort, of Louis Philippe and members of the Orléans family, of Napoleon III and Eugénie, Francis Joseph, Metternich, Queen Alexandra. He achieved a certain flamboyant elegance, and exhibited at the R.A. during 1852-67. He died at Frankfurt, July 9, 1873.

Winter's Bark (*Drimys winteri*). Small evergreen tree of the family Magnoliaceae. A native of



Winter's Bark. Leaves and fragrant flowers of this aromatic evergreen

S. America, it has oblong leaves, glaucous beneath; and fragrant white flowers, an inch across. The bark has tonic stimulant properties, and is aromatic.

Winter Sports. Term for open-air activities carried out on ice and over deep snow. Developed from localised ways of moving over those impediments, they include skating, tobogganing, sleighing, and ski-ing, all of which have their entries in this work. The idea of turning these means of locomotion into an attraction for visitors is said to have originated with John A. Symonds when at Davos in 1870; and it was in Switzerland

chat, thanks chiefly to the enthusiasm of British sportsmen, winter sports developed into a highly commercialised source of winter income for resorts previously dependent on summer visitors. Switzerland remains the chief site of winter sports; but they have been developed also in other suitable areas, e.g. Austrian Tirol; Buffalo national park, Victoria, Australia; the Canadian Rockies. See Curling; St. Moritz.

Winter's Tale, THE. Drama by Shakespeare. It is an odd mixture of melodrama and pastoral comedy. When the curtain rises Polixenes, king of Bohemia, is entertained by Leontes, king of Sicilia, who suspects him of adultery with Leontes's wife, Hermione. Polixenes takes flight, and Hermione is cast into prison, there to give birth to a daughter, whom Leontes orders to be abandoned in a desert place. The oracle of Apollo then declares that Hermione is innocent and that Leontes will die without an heir unless his daughter is found. His son Mamilius dies. Sixteen years elapse, and we are in Bohemia, "a desert country near the sea," where the lost child Perdita is brought up as a shepherdess. She is wooed by Florizel, son of Polixenes, and taken home, upon which her parents are reunited. The later acts contain beautiful poetry, especially in Perdita's part, while that of Autolycus, "a snapper-up of unconsidered trifles," is bluff comedy.

Written c. 1610 but first printed in the 1623 Folio, the play was founded upon Robert Greene's novel, *Pandosto, or The Triumph of Time*, 1598. It was put on at the Old Vic, 1933 and 1936; Open-Air Theatre, 1937 and 1944.

Wintertthur. Town of Switzerland, in the canton of Zürich. It stands at an elevation of 1,447 ft., overlooking the Eulach, 17 m. by rly. N.E. of Zürich. A rly. junction of seven lines, it manufactures locomotives, as well as machinery and textiles. Its mineral baths are much frequented. At Ober Wintertthur, the Roman Vitodurum, 1 m. N.E., are many relics of antiquarian interest. A possession of the counts of Kyburg, the town passed to the Hapsburgs in 1264, and was sold to Zürich in 1467. Pop. 58,883, seventh in the country.

Winterton, EDWARD TURNOUR, 6TH EARL (b. 1883). British politician. He was born April 4, 1883, and went to Eton and New College, Oxford. At 21 he was elected Unionist M.P. for Horsham, which he continued to represent, so that

by 1945 he was the father of the house of commons. In 1907 he inherited, as 6th earl, an Irish title created in 1766. He was under-secretary for India, 1922-24 and 1924-29, chancellor of the duchy of Lancaster, 1938, and postmaster-general, Jan.-Nov., 1939.

Perhaps the bluntest member of the house, Lord Winterton published in 1932 a volume of reminiscences, *Pre-War, 1904-1910*.

Winthrop, JOHN (1588-1649). English colonist. Born at Edwardstone, Suffolk, Jan. 12, 1588, and educated at Trinity College, Cambridge, and the Inner Temple, he threw up a good practice in 1629 and helped to found Boston, Mass. He was 12 times appointed governor of the colony.

Holding strict Puritanical views, he opposed the action of Sir Harry Vane, governor at the time, in allowing Anne Hutchinson to propagate her religious opinions. In 1643 he was first president of the commissioners of New England. He died at Boston, March 26, 1649. *Consult* Life and Letters, R. C. Winthrop, 1864-67; Winthrop Papers, Mass. Hist. Soc., 1926.

Winthrop, JOHN (1606-76). English colonial governor. Born at Groton, Suffolk, Feb. 12, 1606, son of the above



John Winthrop, colonial governor

John Winthrop, he was educated at Trinity College, Dublin, and the Inner Temple. In 1631 he emigrated to America, where he was one of the founders of Ipswich, Saybrook, and New London. He was governor of Connecticut in 1634, 1657-58, and from 1659 until his death, April 5, 1676.

Winton. Name by which Winchester is sometimes known. It is used by the bishop as a signature; also on old milestones.

Winton. Township in N.W. Queensland, Australia. In the centre of a rich grazing district, it is a junction of Central and Northern rlys., 530 m. W. of Rockhampton. Pop. 1,600.

Wire. Thread or slender rod of metal, usually circular in section. The metals chiefly used are highly ductile—gold, silver, copper, etc., and alloys, steel, iron-nickel, etc.

WIRE DRAWING. This process consists of drawing a metal rod through a series of dies of successively smaller areas. The metal is elongated as it is reduced in cross-section. Only a small reduction occurs in a single die. The number of dies used to make a large reduction is limited for each series, in hot working by cooling of the metal, in cold working by strain hardening. The former necessitates reheating, the latter annealing, before further reduction.

For the manufacture of steel wire the billets or ingots of steel are rolled into round rods. The end of the rod is pointed by hammering, filing, or rolling, so that it can pass through the hole in the draw-plate and be gripped ready for drawing completely through. To lessen the wear on the dies, soapy water, oil, tallow, wax, etc., are used as lubricants, or the rod being drawn is previously dipped in a solution of copper sulphate.

In the manufacture of certain fine wires dies of precious stones are used. The finest are made by coating the original metal with silver, drawing as fine as possible, and then removing the silver. See Barbed Wire.

Wireless. The popular name for radio-telegraphy and radio-telephony. The salient points in the early history of radio-telegraphy were Clerk-Maxwell's enunciation in 1867 of the theory of electric-magnetism and his assertion of the existence of electric waves, and the first production of such waves by Hertz in 1887 (Hertzian waves); Branly's invention (1890) of a coherer for detecting such waves; Marconi's practical application of the principle in 1895, by using an elevated wire (antenna) as one plate of a condenser, and the earth as the other, with the air as the intervening non-conductor; the celebrated Patent No. 7,777 (1900) of the Marconi Company, which applied the theory of electrical tuning to the transmitting and receiving circuits; the invention, by Fleming in 1904, of the thermionic valve; of the arc (replacing Mar-

coni's spark), first used by V. Poulsen in Denmark, 1903; of the three-electrode valve, by L. De Forest in 1906; and of the alternator, a generator used for supplying oscillatory currents direct to the antenna, first used by R. Goldschmidt in Germany, 1911. Radio-telephony developed rapidly for naval and military use during the First Great War. For a full technical description of radio-telegraphy and radio-telephony, see *Radio*. See also *Aerial*; *Broadcasting*; *Electro-Magnetic Wave*; *Radar*; *Telegraphy*; *Telephony*; *Thermionic Valve*.

Wire Rope. See *Rope*.

Wireworm. Popular name given to the larvae of certain beetles of the family Elateridae; and sometimes erroneously to other creatures. They are slender, yellow-brown, with very short legs placed far forwards and a pointed hind extremity. Smooth and shining, they are tough skinned. They live up to nearly five years before pupating, feeding below ground at the roots of grasses, cereals, and other crops. When grassland is ploughed in, and the sod broken up and buried, wireworms feed on the roots of the crop that follows, often causing severe damage. With the extensive conversion of grass into arable in the U.K. during the two Great Wars, wireworms presented a problem. In the adult state they are called click beetles or skip-jacks. British examples belong to species of *Agriotes*, especially *A. lineatus* and *A. obscurus*, and of *Aithous*.



Wireworm, much enlarged, at the root of a lettuce

Wirksworth. Urban dist. and market town of Derbyshire, England. Situated in a valley at the S. of the Peak, it is 13 m. N.N.W. of Derby on the rly. The 13th century church of S. Mary contains Tudor monuments, a Norman font, and relics of ancient sculpture. Other buildings are the town hall, 1871; moot hall, 1814; hospital; and grammar school, founded 1576. The principal business centres in neighbouring lead mines, worked since Roman times. Wirksworth figures as Snowfield in Adam Bede, Elizabeth Evans (Dinah Morris) having been a native; her pulpit is pre-

served in the Bede memorial Methodist church. Market day, Tues. Pop. 4,680.

Wirral. Peninsula of Cheshire, England. Between the estuaries of the Mersey on the E. and the Dee on the W., it extends nearly to Chester. It is dotted with seaside resorts, and away from the coast is well wooded. One member is elected to parliament, apart from those of the boroughs. Here are industrial Birkenhead, residential Wallasey with several dormitory suburbs of Liverpool, resorts like Bromborough and West Kirby, and Neston inland.

Wisbech. Mun. bor., market town, and river port of the Isle of Ely, Cambs, England. It stands on the Nene, on the Norfolk border, 13 m. S.W. of King's Lynn, and has rly. connexion with Cambridge and Peterborough. Wisbech is a marketing centre for the Fens, grows fruit, flowers, and bulbs, has printing works and timber yards, makes beer and oil-cake, and does a trade by river in agricultural produce, timber, bricks, and pitch. William the Conqueror's castle shows a few remains; the church of SS. Peter and Paul, restored 1873, contains Norman work; in the Brinks is graceful Georgian architecture; Bridge Street is dominated by the Clarkson memorial, the emancipator of slaves having attended Wisbech grammar school. Known since the 7th century, the town received a charter of incorporation in 1549. Market days, Mon. and Sat. Pop. est. 17,200.

Wisby or Visby. City and seaport of Sweden, the capital of the island of Gothland. It is on the W. coast of the island, 44 m. from the mainland and 150 m. S. of Stockholm. One of the most interesting cities of Europe, Wisby retains its extensive walls and their accompanying 38 towers. The cathedral of S. Mary is a fine building of the 13th century, with later additions. The churches include those of the Holy Ghost, S. Clement, S. Catherine, and S. Nicholas, all evidence of the time when Wisby was much larger than it is now. There are interesting ruins, including those of the place of execution. The museum and library are modern. The port has a modern harbour, the Hanseatic one having been destroyed, and an export trade. Wisby is thought to have existed as far back

as the Stone age. It became a member of the Hanseatic League and was wealthy and prosperous in the 11th-14th centuries, being the main Hanseatic entrepôt in the Baltic. The city became Swedish in 1648. Pop. 13,022.

Wisconsin. Chief river of Wisconsin state, U.S.A. It rises in the N. part of the state, on the borders of Michigan, and flows generally S. to Portage, and then W. and S.W. to unite with the Mississippi at Prairie du Chien. It is about 430 m. long and is navigable to Portage.

Wisconsin. North-central state of the U.S.A. Bounded in part on the E. by Lake Michigan, N. by Lake Superior, and W. by the Mississippi, it has an area of 56,154 sq. m., and forms an undulating plateau from 650 ft. to 1,000 ft. in height, presenting little relief apart from rocky masses bored by erosion. The St. Croix on the W. frontier, the Wisconsin, Chippewa, and the Black rivers are affluents of the Mississippi; the Fox, the longest river in the E., flows into Green Bay; Winnebago is the largest of many lakes.

Popularly known as the Badger state, Wisconsin was mainly agricultural until 1900, but by 1936 its manufactured products reached five times the value of crops. This increase in manufacture is due to the proximity of vast iron and coal deposits along the shores of the Great Lakes. Iron ore, zinc, and lead are turned into farm machinery, engines, pumps, refrigerators, metal furniture, precision instruments, and plumbing equipment. The Panama Canal was dug with 77 steam shovels manufactured in Wisconsin. Rivers offer hydro-electric power up to a potential capacity of one million h.p., of which about half is in use. National forests exceed two million acres. An important milling industry is based on the wheat crop, second largest in the U.S.A. In dairy produce Wisconsin ranks first. Co-operative practice applies in the food industries; this activity is now controlled by a law based on principles evolved by flannel workers of Rochdale, Lancs.

Two senators and 11 representatives are sent to congress. The state was admitted to the Union in 1848. Madison is the capital and contains the university, but Milwaukee is much the biggest city, other places being Racine, Kenosha, Green Bay, and La Crosse. Half the foreign-born inhabitants are Germans. Pop. 3,137,587. The standard book is ed. F. L. Holmes, 5 vols., 1946.



Wirksworth arms

Wisconsin Rapids. City of Wisconsin, U.S.A., the co. seat of Wood co. On the Wisconsin river, 90 m. N.N.W. of Madison, it is a rly. junction on the Chicago, Milwaukee, and St. Paul line. The river divides the city into two parts connected by a fine bridge. A rly. centre and the distributing point for a large district, the city has machinery works, foundries, lumber yards, and makes paper, pulp, furniture, and wagons. Its buildings include a city hall, court house, hospital, and public library. A city charter was granted in 1869, when the place was called Grand Rapids. Pop. 11,416.

Wisden's Almanack. Annual handbook devoted exclusively to cricket. It was started in 1864 by John Wisden (1826-84), professional cricketer, writer on the game, and sports outfitter. In normal times each edition gives the full score of every first-class match played in the preceding summer, with a wealth of statistics, averages, records, birthdays and obituaries, and such feature articles as "five cricketers of the year."

Wisdom, Book of. Book of the O.T. Apocrypha, which purports to be the work of Solomon, and in Greek manuscripts is entitled *The Wisdom of Solomon*. It was written by an Alexandrian Jew, probably between A.D. 1 and 40, to counteract the scepticism and Epicureanism represented in the Book of Ecclesiasticus. There is a good commentary (1913) by A. T. S. Goodrick in the Oxford Church Bible Commentary. See Apocrypha.

Wise, Thomas J. (1859-1937). British bibliophile and literary forger. Originally a clerk in a London firm, he prepared facsimiles of first editions for the Shelley Society, and later began forging "rare" 19th century pamphlets and "first editions" of great writers on an extensive scale for the second-hand market, though he also made genuine and valuable discoveries. He succeeded in deceiving all experts, and was the recipient of academic honours, e.g. was made an hon. fellow of Worcester College, Oxford. In 1934 two booksellers, J. Carter and G. Pollard, published an account of their own detailed examination of many of Wise's alleged discoveries, denouncing them as forgeries. No explanation was ever offered by Wise. On his death, his collection, undoubtedly containing much of real value, was purchased by the British Museum. Consult Thomas J. Wise in the *Original Cloth*, W. Partington, 1947.

Wiseman, (Frederick) Luke (1858-1944). English divine. He was born at York, Jan. 29, 1858, son of the Rev. L. H. Wiseman, and educated at Sutherland House, Highgate; London university; and Didsbury theological college, being assistant tutor at the last-named, 1881-87. He then took charge of the Central Hall mission in Birmingham for 25 years. In 1912 he was chairman of the Wesleyan Methodist conference, a position his father had held 40 years earlier. After the Methodist reunion, he was president of the conference, 1933-34, and in 1940 became minister at Wesley's chapel, City Road, London. Always interested in the musical side of worship, he composed much, and wrote a study of Charles Wesley. Wiseman died Jan. 16, 1944.

Wiseman, Nicholas Patrick Stephen (1802-65). British prelate. Born at Seville, of Irish parentage, Aug. 2, 1802, he was educated at Ushaw and in Rome. During 1828-40 he was rector of the English college in Rome, where his learning won him a curator's post in the Vatican library and a professorship in Oriental languages in the university. In 1840 he went to England, where his lectures and writings had already made him known. Ordained bishop, he was made president of Oscott College, and had charge of churches in the midlands. He had previously helped to found *The Dublin Review*.

Nicholas Wiseman,
British prelate

In 1850, when the pope established a hierarchy in Great Britain, Wiseman was made first archbishop of Westminster and a cardinal. He continued in office until he died, Feb. 15, 1865. Wiseman more than anybody was responsible for the increase of Catholicism in England. He was an indefatigable social reformer, and founded retreats and communities. There are Lives by W. Ward, 1897; D. Gwynn, 1929.

Wishart, George (c. 1513-46). Scottish reformer and martyr. A schoolmaster at Montrose, in 1538 he was charged with heresy in teaching the Greek Testament and had to take refuge in England. In 1539 he was convicted on a similar charge arising out of lectures delivered by him at Bristol, and next spent some time in Germany and



George Wishart,
Scottish reformer

Switzerland, afterwards entering Corpus Christi College, Cambridge. An English translation of the Confession of Faith of the Churches of Switzerland made by Wish-

art about this time was published in 1548. He returned to Scotland in 1543, but in 1545 was arrested, tried for heresy at St. Andrews, and burnt, March 1, 1546.

Wishaw. This former Scottish burgh, in Lanarkshire, was in 1920 united with Motherwell (q.v.).

Wisley. Village of Surrey, England, 4 m. E. of Woking. It has a common, but is principally known for the gardens of the Royal Horticultural Society, opened 1904, which include a laboratory and research station.

Wismar. Seaport of E. Germany, in the *Land of Mecklenburg*. It is situated on the bay of Wismar, 20 m. N. of Schwerin and 149 m. N.W. of Berlin, on a fine natural harbour. The chief buildings are St. Mary's, St. George's, and St. Nicholas's churches, three fine survivals of the 13th-15th centuries, and a 16th century edifice once the residence of the dukes of Mecklenburg. Others are the town hall, museum, etc., and there are old houses. Wismar is a fishing port and in normal times has shipbuilding and engineering works. Entered by the British 6th airborne div., May 2, 1945, it lay in the Russian zone of occupation after Germany's surrender. A Hanseatic town, Wismar was Swedish, 1648-1903. Pop. 26,016.

Wissembourg (Ger. Weissenburg). Town of Alsace, France, in the dept. of Bas-Rhin. It stands on the Lauter, 42 m. N.N.E. of Strasbourg. There is a beautiful church, once belonging to a Benedictine abbey founded in the 7th century. The church itself dates from the 13th century. Wissembourg, which became a free city in 1305, has some manufactures, but is chiefly famous for its battles. It was conquered by the French in 1673, and here in Oct., 1793, the Prussians stormed some fortifications defended by the French. On Aug. 4, 1870, the Germans, under the crown prince, gained their first victory in the war against France. In German occupation from 1940, the town was liberated March 19, 1945, by the U.S. 7th army. Pop. 7,000.

Wissmann, HERMANN VON (1853-1905). German explorer. He was born Sept. 4, 1853, at Frankfort-on-Oder, and served in the army until 1880, when he entered the German African co. He set out from Loanda and made his way across Africa, reaching Zanzibar in 1882. In 1883 he explored the Congo basin, and passed four years in investigating the lands round Lakes Tanganyika and Nyasa. German commissioner from 1889, and governor of German East Africa 1895-96, Wissmann died July 15, 1905.

Wistaria. Genus of plants including *W. chinensis*, the Chinese kidney-bean tree. It is a climbing



Wistaria. Spray of flowers and leaves of this climbing shrub

shrub or tree of the family Leguminosae, and a native of China. The long leaves are broken up into about six pairs of oval leaflets, clothed with silky down. Wistaria may be planted in any well drained soil, against a sheltered wall, in spring, and allowed to grow at will, being pruned only as absolutely necessary in Feb. or March.

Wit (A.-S. *witt*, knowledge; in a personal sense, A.-S. *wita*, a wise man). Term formerly equivalent to intelligence or understanding, still used in the plural for the mental faculties. Through the transitional sense of intellectual brilliance or alertness, as practised by the men of letters of the 18th century, the word has come to mean the power, displayed in conversation and literature, of affording intellectual satisfaction by the unexpected association of apparently unconnected ideas, some point of similarity being realized with a shock of surprise. It differs from humour (*q.v.*) in appealing to the intellect rather than to the feelings, and is rarely quite devoid of some degree of malice.

Brevity and an appreciation of the niceties of language are proper to wit, which is an essential ingredient in the epigram, and in such figures of speech as paradox, antithesis, and antilimax. The quality is conspicuous in Shakespeare, Dryden, Congreve, Pope, Swift, Sheri-

dan, Byron, Lamb, Sydney Smith, Meredith, Wilde, Chesterton, but is more characteristic of French than English literature.

Witan. Short name for the Anglo-Saxon assembly known as the Witenagemot (*q.v.*).

Witch. Term now generally restricted to a sorceress or female magician, the male counterpart being a wizard, a word formed from wise. Witch, formerly applied to both sexes, is A.-S. *wicca*, masc., *wicce*, fem., from the verb *wiccean*, which appears to have meant originally to make to yield, to make "weak," hence to conjure away. Wicked is a derivative. The older name for a witch was hag, A.-S. *haegtesse* (*cf.* Ger. *Hexe*), originally a female demon. The witches in Macbeth are perhaps ultimately derived from the Norns. See Norn.

Witchcraft. Term applied to forms of sorcery or magic alleged to be practised by women in league with demons. Witches were believed to cause death or injury by spells, potions, etc., to raise storms and blast crops and cattle, and to obtain infernal aid in gaining wealth, gratifying lust, and knowing future events, to travel through the air on broomsticks, and transform themselves into animals. Belief in witchcraft was a relic of an early pagan cult which identified gods or devils as inhabiting the souls of particular animals or human beings. The witches' sabbaths were the four great annual assemblies of the devotees of the cult. They took place on Feb. 2, April 30, Aug. 1, and Oct. 31; there were also the smaller weekly assemblies of local witches, known as covens.

The earlier ecclesiastical view that witchcraft was a delusion gradually yielded to a fanatical fear of a vast anti-Christian conspiracy. From 1258 the Inquisition treated witchcraft as heresy. A great persecution began in 1434 and was intensified by a bull of Innocent VIII, 1484. Texts like Ex. 22, v. 18, provided a ground for execution, generally by burning. The belief was largely of scholastic origin, supported by confessions under torture. Lingering paganism accounts for some facts. While most alleged witches may have been normal, others were hysteri-

cal or insane, and, with some, suggestion and psychical phenomena played a part.

Persecution spread to America, *e.g.* Salem, 1692. The British penal laws were repealed 1736, the last execution for witchcraft having taken place at Dornoch, 1722. It has been estimated that in Europe generally 300,000 supposed witches suffered death, 1484-1782. Late in the 19th century such persons were occasionally lynched. See Brocken; Demonology; Evil Eye; Hopkins, M.; Magic; Walpurgis Night.

Bibliography. Witch, Warlock, and Magician, W. H. D. Adams, 1889; History of English Witchcraft, W. Notestein, 1910; Witchcraft, C. Williams, 1941; Witchcraft in England, C. Hole, 1945; Four Centuries of Witch Beliefs, R. T. Davies, 1947.

Witches' Brooms. Alternative name for Witch Knots (*q.v.*).

Witch Hazel (*Hamamelis virginica*). Shrub or small tree of the family Hamamelidaceae, native of N. America. It has alternate oval leaves, and flowers late in autumn. The flowers are yellow, with four long strap-shaped petals, and the fruit is a capsule containing a single bony, edible seed which is not mature till the summer. The leaves and bark are astringent.



Witch Hazel. Twig with leaves and flowers

Witch Knots.

Clusters of short, crowded shoots on trees, particularly birch and hornbeam. At a distance resembling rooks' nests, they are caused by minute internal fungi, which set up a diseased condition causing the branches to be swollen and inducing an abnormal number of shoots which branch in all directions. The fungus is *Euxoaous betulinus* in the birch; a similar condition in the wild cherry is caused by *E. cerusi*. The witch knot of the hornbeam is the work of *E. corpinii*. Abnormal growths of silver fir and Scots pine produced by the fungus *Peridermium elatinum* are called witches' besoms. See Gall.

Witenagemot (A.-S. *witena gemot*, assembly of the wise). The official national council of a Saxon or English kingdom. Its powers, functions, and composition depended upon custom, not upon written law. Broadly speaking, the supreme authority in the Saxon kingdom was the king, but he took no action of general importance

without consulting the Witan, or wise men, representing what in earlier days had been the council of chiefs.

But as in early days measures of importance had been submitted to the approval of the free men assembled in arms, so on special occasions the Witan took the character of a general assembly, a meeting of such freemen as found it convenient to attend. Thus when there was a king, the Witan was an informal consultative body without whose approval the king could not venture to take any disputable steps. On emergencies the magnates acted in the character of a national assembly, and deposed a king, while on the death of a king, since there was no law actually fixing the succession, it lay with the magnates, acting as a national assembly, to recognize his successor. The Witan remained, and even for a short time retained its name, after the Norman Conquest. *Pron.* Witten-ag-emote.

Witham. River of Lincs, England. It rises just in Rutland, near Market Overton, and flows in a wide northerly curve past Grant-ham, Lincoln, and Boston to the Wash, into which it falls 5 m. from Boston. It is used by small vessels as far as Lincoln, and is about 70 m. long.

Witham. Urban dist. and town of Essex, England. On an affluent of the Blackwater, 14 m. S. W. of Colchester, on the high road to London, it is a rly. junction. The church of S. Nicholas, mostly dating from c. 1325, contains effigies and monuments. The local industry is mainly agricultural, but there is some milling, while steel windows and gloves are made. Pop. 6,000. *Pron.* Wit-ham.

Wither or **WITHERS**, GEORGE (1588-1667). English poet and pamphleteer. Born at Bentworth, Hants, June 11, 1588, and educated at Magdalen College, Oxford, he was admitted to Lincoln's Inn in 1614. Several times imprisoned, in con-

sequence of his writings, in the Marshalsea and Newgate, Wither was at once a satirist, a lyric writer, a Puritan, a hymn writer, and a soldier, fighting for and against Charles I. He displayed notable courage during the plague, and died in the Savoy, May 2, 1667. His works include the satires *Abuses Stript and Whipt*, 1611; *Hymnes and Songs of the Church*, 1623; *The Schollers Purgatory*, 1624; *Halleluiah*, 1641. One of his best lyrics is *Shall I, Wasting in Despair? Consult Works*, 20 vols., 1871-82; *Poems*, ed. F. Sidgwick, 2 vols., 1902.

Witherite. Ore mineral of barium, barium carbonate, second in importance to barytes (*q.v.*). Witherite is white in colour and possesses a resinous lustre. It occurs as a gangue mineral associated with galena and barytes in many lead veins. Witherite is useful as a source of barium salts, and a little is used in pottery.

Withington. Residential dist. of Manchester, England. It lies about 4 m. S. of the city proper, and is served by rly. An M.P. is



Witney, Oxfordshire. The market place with the Butter Cross. In the distance is the parish church, and a corner of the Town Hall is on the left

elected. Pop. 44,600. There are villages of this name in Cheshire, Glos, Herefordshire, and Salop.

Without Prejudice. Term used by lawyers to signify that what is being done is not to prejudice the legal rights of the parties. It is chiefly used in negotiations for the settlement of claims. Thus, where a defendant offers without prejudice to pay £50 in settlement of a claim for £100, and the offer is not accepted, the plaintiff cannot use the offer as an admission by the defendant that something is owing.

Withy or **WITHE** (A.-S. *withig*, twig). Technical term used to describe tough, flexible twigs of wood, used for binding things together. The term occasionally means any flexible or elastic handle fitted to a tool to minimise shock to the worker's hand.

Witley Court. Mansion and park in Worcestershire, England, about 5 m. S.W. of Stourport. Residence during 1843-46 of the dowager Queen Adelaide, the property passed to the earl of Dudley, who spent £250,000 in enlarging and improving it. The mansion, in the Italian style, built in the 18th century by Lord Foley, stands in a park of 500 acres, notable for its fine oaks and stocked with deer. It is connected by corridor with the church, 1735, restored 1862, which has a painted ceiling by Verrio.

Witness (A.-S. *witnes*, testimony). In legal proceedings, one who gives evidence. A witness must appear in accordance with the terms of the subpoena. He need answer no question tending to incriminate himself, but must not leave the court after giving evidence until the case is ended, being liable to recall at any point. *See* Evidence; Oath; Subpoena; Trial.

Witney. Urban dist. and market town of Oxfordshire, England. On the Windrush, 10 m. W. by N. of Oxford, it is served by rly. The parish church of S. Mary, restored in 1867, contains remains of a Norman building. Other features are the ancient town hall, corn exchange, free grammar school, and Bluecoat school dating from 1723. The butter cross in the market place was put up in 1683. Witney is famous for its blankets. Pop. 6,381.



Witney arms

Witt, JAN DE (1625-72). Dutch statesman. Born at Dort, Sept. 24, 1625, he was educated at Leyden, and became a lawyer at The Hague, being appointed to a civic post at Dort, 1650. Three years later he was chosen grand pensionary of Holland, becoming practically ruler of that country in domestic and foreign affairs. He was the greatest of those who held the office. In 1654 he concluded an honourable peace with England, by one of the secret terms of which William of Orange was excluded from the Dutch stadtholdership. On the restoration of Charles II this clause was one of the causes of the Anglo-Dutch war of 1665. De Witt was responsible for prosecuting the war, and



Jan de Witt, Dutch statesman
After Netscher



George Wither,
English poet

showed brilliant diplomacy in effecting the peace of Breda, which concluded it. He also arranged the Triple Alliance between Holland, England, and Sweden, 1668. But the war with France in 1672, with the machinations of the followers of William of Orange, destroyed his popularity and broke his power. He resigned on Aug. 4, and on the 20th at The Hague was with his brother Cornelius (1623-72) brutally done to death by an infuriated mob.

Witt, Sir Robert Clermont (b. 1872). British art collector. Born Jan. 16, 1872, he was educated at Clifton and New College, Oxford. He became a prominent solicitor before devoting himself to studying art. A founder and president of the national art collections fund, he was trustee of the National Gallery with short intervals, 1916-40, and of the Tate Gallery, 1916-31. He started a comprehensive library of photographs of paintings and drawings. Knighted in 1922, Sir Robert published *How to Look at Pictures*; 100 Masterpieces of Painting; *The Nation and Its Art Treasures*.

Wittelsbach. Name of the German family ruling in Bavaria until 1918. From Luitpold, duke of Bavaria (d. 907), descended the counts of Scheyern, who about 1124 became counts of Wittelsbach, a castle N.E. of Augsburg. In 1180 Otto I became the first hereditary duke of Bavaria. Otto II was made count palatine of the Rhine, 1214, and from 1294 there were separate Palatine and Bavarian lines. The former, whose head became an elector, 1356, supplied an emperor in Louis IV, 1314, and a German king in Robert III, 1400. From him descended the Zweibrücken branch, which gave three kings to Sweden—Charles X, XI, and XII, 1654-1718. The Bavarian Wittelsbachs, electors from 1623, became extinct, 1777, and were succeeded by the elector palatine, and in 1799 by the duke of Zweibrücken, who became the first king of Bavaria in 1806 as Maximilian I. See *Bavaria*; *Palatinate*.

Witten. German town in N. Rhine-Westphalia. A rly. junction, 31 m. N.N.E. of Cologne, it was formerly an agricultural centre around two castles, Haus Witten and Steinhäusen, both built c. 1500. It has an old church of S. John, reconstructed 1762; a museum; and an open-air theatre. Its industries comprise iron, glass, and ceramic works, as well as coal mining. In the Ruhr (q.v.) basin, it suffered widespread dam-

age during the Second Great War, though the pop. remained approx. 73,000. It lay in the British zone of occupation after the war.

Wittenberg. E. German town and county seat of Saxony-Anhalt. It is on the right bank of the Elbe, 58 m. S.S.W. of Berlin. Though an industrial centre, with engineering, paper, chocolate, food preserving, and soap works, its fame comes from its association with Luther. Here on Nov. 1, 1517, the 95 theses were nailed to the castle church. Luther lived in the Augustine monastery; he preached in the town church (14th cent.), where he and Melancthon were buried. The houses of the two reformers and of Lucas Cranach are preserved; so are a palace (1490-99) of the Saxon electors and a town hall of that period. Originally a Flemish settlement, Wittenberg received urban rights in 1293; had during 1502-1817 the university now at Halle; suffered during the Hussite and the Thirty Years War, and in those of Frederick II; was turned into a fortress by Napoleon, stormed by the Prussians in 1814, and fell to them next year. Captured by the Russians April 25, 1945, it lay in the Russian zone of occupation after the surrender of Germany. Pop. 37,000.

Witton Gilbert. Village and parish of Durham, England. It is 3 m. N.W. of Durham, on the rly. The church of S. Michael, rebuilt in 1867, is an ancient foundation; the 13th century lepers' hospital,



Woad. Left, clusters of flowers and fruit. Right, part of stem

founded by John Pudsey, bishop of Durham, was rebuilt as Witton Hall.

Wittstock. Town of E. Germany, in the Land of Brandenburg. It stands on the Dosse, 60 m. N.W. of Berlin, and has some manufactures, chiefly of textiles and wood. Medieval walls, towers, churches, and a town hall of 1530 still stand. Here on Oct. 4, 1636, the Swedes

destroyed the army of the elector of Saxony, gaining one of the great victories of the Thirty Years War. Pop. 8,373.

Witu. Town in Kenya Colony. It is situated near the coast, a few miles N. of the Tana river. In 1885 it was occupied by the Germans, who in 1889 declared a protectorate over the sultanate of which it was the capital. Next year, however, they handed it over to Great Britain. See *Kenya*.

Witwatersrand. Full name of the gold-bearing dist. in the Transvaal, S. Africa, known in brief as the Rand. In geology, the Witwatersrand system is the name given to the gold-bearing strata in the S. part of the Transvaal. The metal is found in reefs of quartz pebbles compacted with iron oxides, pyrites, and silica. The university of Witwatersrand, founded at Johannesburg in 1922, takes over 3,000 students. See *Gold*; *Johannesburg*; *Rand*; *Transvaal*.

Wladyslaw. Polish form of a Slav name usually rendered in English as Ladislas (q.v.).

Wloclawek. Town of Poland, in the govt. of Warsaw. On the left bank of the Vistula and the Warsaw-Bydgoszcz rly., it is 117 m. N.W. of the capital. There are ironworks and factories of earthenware goods. The Gothic cathedral dated from 1365. Wloclawek was liberated by Zhukov's 1st White Russian army Jan. 20, 1945, during the Second Great War. Pop. (pre-1939) 56,000.

Woad (*Isatis tinctoria*). Biennial herb of the family Cruciferae, native of Europe and N. Asia. The root-leaves are oblong or oval; those of the stem arrow-shaped without stalks. Small yellow flowers are crowded in an elongated cluster. The seeds are contained in oblong pods, which are winged, and turn brown when ripe. Identified as the *vitrum* with which Julius Caesar declared that the Britons of both sexes stained the skin, woad was an important crop in Europe, but from the middle of the 16th century it was increasingly supplanted as a source of blue dye by indigo (q.v.). It was still cultivated on a small scale in Lincolnshire for the use of woollen manufacturers until the last expert died in 1945. The dye-stuff is prepared by grinding the leaves into a paste, which is fermented and then kneaded into balls or bricks, and dried in the sun.

Woburn. A market town of Beds, England. It stands on the borders of Bucks, 15 m. S.S.W. of Bedford, its rly. station being Woburn Sands, 2 m. away. The



Woburn Abbey, the 18th century mansion of the dukes of Bedford, built on the site of a Cistercian abbey

old church of S. Mary was pulled down in 1868. The town was at one time a centre of the straw plaiting industry. Market day, Fri. Pop. 1,100.

Near the town is Woburn Abbey, the seat of the duke of Bedford. Surrounded by a fine park, 12 m. in circumference, it stands on land which belonged to a Cistercian abbey founded in 1145 and given to the Russells in 1547. The present house, an 18th century building, contains one of the finest collections of works of art in England. See Bedford, Duke of.

Woburn. City of Massachusetts, U.S.A., in Middlesex co. It is 11 m. N.N.W. of Boston on the Boston and Maine rly. Woburn was incorporated in 1642, and became a city in 1888. Footwear and leather goods are made. Pop. 19,751.

Wodehouse, PELHAM GREENVILLE (b. 1881). British humorous writer. He was born Oct. 15, 1881, and educated at Dulwich. Beginning with school tales, going on to short stories about recurring groups of characters, and turning out farces and the libretti of



P. G. Wodehouse, British writer

musical comedies, he built up a reputation as, for many readers, the funniest writer of his day. On their own plane, his plots were models of construction, and his style was unique, especially in first-person narration by characters of surpassing inanity and charm. Bertie Wooster of Mayfair and his valet Jeeves (*q.v.*), Psmith, Mr. Mulliner, became popular on both sides of the Atlantic. The action of some of Wodehouse's later works took place in the U.S.A. Wodehouse's titles include *The Pothunters*, 1902; *Love Among the Chickens*, 1906; *Psmith in the City*, 1910;

Dynamite, 1948. The author was living at Le Touquet in 1940 when France was occupied by the Germans; and his subsequent broadcasts over the German radio during the war evoked adverse criticism in both the U.K. and the U.S.A.

Woden. A-S. form of Odin (*q.v.*). *Wódnes daeg* is the origin of Wednesday.

Wodrow, ROBERT (1679-1734). Scottish historian. A Glasgow youth, he graduated at the university, where his father was professor of divinity. In 1703 he was ordained and presented to the parish of Eastwood, where he spent the rest of his life, dying March 21, 1734. A popular preacher, and specially interesting himself in church history and politics, Wodrow's principal work is *The History of the Sufferings of the Church of Scotland, 1721-22*. He left at his death other works in manuscript and volumes of correspondence, some of which were afterwards published by the Wodrow Society. One of his 16 children was the Auld Wodrow of Burns's *Twa' Herds*.

Woffington, MARGARET OR PEG (1718-60). British actress. Born in Dublin, Oct. 18, 1718, the daughter of a bricklayer, she acted there quite young, and made her first London appearance at Covent Garden, Nov. 6, 1740, as Silvia in *The Recruiting Officer*. A fortnight later she appeared in her famous breeches part of *Sir Harry Wildair in The Constant Couple*. During 1742-48 she played with Garrick at Drury Lane, and afterwards in Dublin and at Covent



Peg Woffington, British actress

Garden, acting acceptably in tragedy, but achieving her main success as the fine lady of comedy — Milamant, Lady Townley, Lady Betty Modish, Lady Plyant, Piccadilly Jim, 1918; *A Damsel in Distress*, 1919; *The Clicking of Cuthbert*, 1922; *The Cabaret Girl* (musical comedy), 1922; *Summer Lightning*, 1929 (later filmed); *Jeeves Omnibus*, 1931; *The Luck of the Bodkins*, 1935; *Anything Goes* (play), 1936; *Mulliner Omnibus*, 1935; *Uncle*

and Rosalind. She had numerous lovers besides Garrick, and carried on a notable feud with Mrs. Clive. She retired from the stage in 1757, and died March 28, 1760. Reade gave the name Peg Woffington to one of his novels. *Consult Life*, J. F. Molloy, 1884.

Wöhler, FRIEDRICH (1800-82). German chemist. Born at Eschersheim, near Frankfurt - on - Main, July 31, 1800, he was educated at Marburg, Heidelberg, and Stockholm. In 1825 he was appointed chemistry teacher in the polytechnic school in Berlin, and while there isolated aluminium, 1827, by a method developed by Deville on a commercial scale. In 1828 he isolated beryllium, discovered yttrium, and prepared urea synthetically, this being the first instance in which an organic compound had been made artificially. Afterwards, with Liebig, he published papers on mellitic, cyanic, and uric acids. He was professor of chemistry at Göttingen from 1836 until his death, Sept. 23, 1882.

Wohlgenuth, MICHAEL (1434-1519). German painter. Born at Nuremberg, he studied under Hans Pleydenwurff, and became one of the most important artists of the Nuremberg school. He also fostered the arts of wood carving and wood engraving. He was the master of Albrecht Dürer. There were paintings by him in Nuremberg churches, and at Munich in the Pinakothek.

Wohlwill Process. Electrolytic process for purifying gold bullion. The impure bullion containing silver, the platinum metals, etc., is cast into anodes, which are electrolysed in a solution of gold chloride and hydrochloric acid. The tanks used are of porcelain, and the cathode starting sheet is a thin strip of fine gold. The solution is stirred and, on passage of the current, pure gold is deposited on the cathode, while the impurities form an insoluble slime at the bottom of the tank. When the gold cathodes weigh about 80 oz. they are removed, washed, melted in plumbago crucibles, and cast into ingots with a fineness of 999.3 to 999.5 parts per 1,000. The slimes are collected and the silver and other precious metals recovered by chemical processes. This process gives a purer gold than the sulphuric acid parting process; it also allows complete recovery of the platinum metals; but losses are a little higher.

Woizikovsky, LEON (b. 1897). Polish dancer. A pupil of Cecchetti, he studied at the Warsaw ballet school, and in 1915 joined the



Wolf. 1. American timber wolf. 2. Indian species, *Canis pallipes*. 3. European or Siberian wolf
W. S. Barridge, F.Z.S.

Diaghilev co., remaining with it until the founder's death in 1929. He joined the de Basil co. which visited London in 1933, and danced with outstanding success in *Jeux d'Enfants*, *Cotillon*, *The Three-Cornered Hat*, *La Boutique Fantasque*, *Les Présages*, and *Prince Igor*. *Pron.* Vo-iji-kofski.

Woking. Urban dist., giving its name to a co. constituency, of Surrey, England. On the Wey, 6 m. N. of Guildford, it comprises an old village and a newer quarter near the main line rly. station. It is a Green Line bus terminus. The old parish church of S. Peter contains portions of the original Norman building. The London Necropolis is at Brookwood, and in the neighbourhood also are the ruins of Newark priory. Pop. 40,000. *See* Brooklands.

Wokingham. Mun. bor. and market tn., giving its name to a co. constituency, of Berkshire, England. It is 7 m. S.E. of Reading, and is served by rly. The Early English church of All Saints, restored in 1880, contains an ancient font. Market day, Tues. Pop. est. 8,500.

Wolcot, JOHN (1738–1819). British satirist who wrote under the name Peter Pindar (*q.v.*).

Wold (A.-S. *weald*, wood). Term used in England for open, hilly country. The Yorkshire Wolds form a chalk ridge in the E. Riding, extending from Ferriby on the Humber in a curve of 35 m. to Flamborough Head. The highest point reaches 800 ft. The Lincolnshire Wolds form a chalk ridge extending for 45 m. S.S.E. from Barton-upon-Humber to Spilsby. Of an average elevation of about 350 ft., the ridge rises near Claxby to 550 ft. There are also wolds on the borders of Notts and Leics, while the same word appears in Cotswold—*cf.* Stow-on-the-Wold.

Wolf (*Canis lupus*). Member of the dog family. There is probably only one species of true wolf, though many slightly differing varieties or races are known. The European wolf may be regarded as the type.

Wolves occur only in the N. hemisphere, with the exception of a race found in the Falkland Islands. In Europe the wolf ranges over the entire continent, except in a few districts where it has been exterminated. Formerly abundant in Great Britain, it was exterminated in England during the reign of Henry VII, in Scotland about 1743, and in Ireland about 1766. In colour the European wolf is brownish grey with lighter underparts, but white and black specimens are occasionally found. It lives mainly in the forests, and is usually found solitary or in pairs; but in the winter packs combine for hunting. It rarely attacks man, but it often raids the flocks.

The American wolf is greyer in colour and tends to become white in the N. districts. In Alaska occurs a very large creature which measures nearly six ft. in length, including the tail, and stands 31 ins. high at the shoulder. The so-called timber wolf has a shorter tail, but is only a local race of the grey wolf. In Spain the wolves have white patches on the cheeks and throat. *See* Animal; Coyote; Dog.

Wolf, FRIEDRICH AUGUST (1759–1824). German scholar. Born Feb. 15, 1759, at Hainrode, near Nordhausen,



Friedrich Wolf,
German scholar

he became a professor at Halle, but in 1807 was obliged by the French occupation to move to Berlin. He died at Marseilles, Aug. 8, 1824. In his *Prolegomena ad Homerum*, 1795, he started the theory that the *Iliad* and the *Odyssey* are ancient ballads by many writers brought together and unified long afterwards. Wolf is acclaimed as founder of the science of philology.

Wolf, Hugo (1860–1903). Austrian composer. Born at Windischgraz, March 13, 1860, he studied at Vienna conservatoire, and in 1886 became music critic to the *Vienna Salonblatt*, a post he resigned after the publication of his first group of songs. For the rest of his life he existed—nervous, fractious, and frequently in dire poverty—mainly on the generosity of those who admired his music. He became insane in 1897, and died in an asylum, Feb. 22, 1903.

One of the supreme song writers, Wolf achieved a miraculous fusion of melody and declamation. The best-known songs were composed chiefly between 1887 and 1891, and grouped as *Mörike Lieder*, *Eichendorff Lieder*, *Goethe Lieder*, songs from the *Spanisches Liederbuch* of Heyse and Geibel, and from the former author's *Italianisches Liederbuch*. Some of these last date from the 1890s, as do settings to three Michelangelo sonnets. Instrumental works by Wolf include the early symphonic poem *Penthesilea*; Italian serenade for strings; choral works, *Christnacht*, and *Dem Vaterland*. An opera, *Der Corregidor*, first performed at Mannheim in 1896, was lyrical rather than dramatic. The best-known *Life* is by E. Newman, 1907.

Wolf, LUCIEN (1857–1930). A British journalist. Born in London Jan. 20, 1857, of Jewish family, he was educated in Brussels and Paris, worked on the staff of *The Jewish World*, 1874–93, and was its editor, 1906–08. Foreign editor of *The Daily Graphic*, 1890–1909, he also contributed to periodicals on matters of Jewish interest. He was several times president of the Jewish Historical Society of England. Representing the Anglo-Jews at the Paris conference of 1919, he effected various minority treaties. He published historical works on the Jews in England, Russia, etc.; *Life of Sir Moses Montefiore*, 1884. His *Essays in Jewish History*, ed. C. Roth, were reissued in 1934, Wolf having died Aug. 23, 1930.

Wolf, MAX FRANZ JOSEPH CORNELIUS (1863-1932). German astronomer. Born at Heidelberg and



Max Wolf,
German astronomer

educated at Heidelberg and Strasbourg universities, he was appointed director of Königstuhl observatory in 1893, and in 1902 professor of astronomy at Heidelberg.

When he died, Sept. 6, 1932, he was president of the German astronomical association. Wolf is known for the periodical comet discovered in 1884 and named after him, and for his discovery by photographic means of more than 200 asteroids.

Wolfe, HUMBERT (1885-1940). British poet and critic. Umberto Wolfe was born in Milan of Jewish parents, Jan. 5, 1885, and went from Bradford grammar school to Wadham College, Oxford. He entered the board of trade, 1908, helping to form a labour dept.—



Humbert Wolfe,
British poet

later the ministry of Labour, of which he became deputy secretary in 1938. He died Jan. 5, 1940. As a poet his diction became elaborate when he treated problems of philosophy in a religious rather than in a philosophical way; but he had a mordant wit which found scope in satire and epigrams. He founded his reputation with London Sonnets, 1920, and Kensington Gardens, 1924; Kensington Gardens in Wartime appeared in 1939, following many volumes of verse. Wolfe's most ambitious work was probably The Uncelestial City, 1928, with its rarefied beauty. Lampoons came out in 1925; Dialogues and Monologues (prose criticism) in 1928. The Silent Knight (in rhymed verse) was performed at the St. James's Theatre in 1937. The Upward Anguish described school and Oxford, and Portraits by Inference, 1934, was reminiscent.

Wolfe, JAMES (1727-59). British soldier. Born at Westerham, Jan. 2, 1727, he was educated at Greenwich and in 1741 was commissioned in his father's corps of marines. Transferring to the 12th foot regiment, he fought in Flanders and Prussia, 1742-45, being

present at Dettingen. In 1745-46, now brigade-major, he served against Prince Charles Edward, taking part in the battles of Falkirk and Culloden. In the Netherlands, 1746-47, he was wounded at Lawfeldt. After several years of garrison duty in England and Scotland, Wolfe accompanied the expedition to Rochefort in 1757 as quartermaster-general, and next year was appointed to command a brigade in America, where he distinguished himself at the siege of Louisburg.

Promoted maj.-gen. in Jan., 1759, he was given command of the force sent up the St. Lawrence against Quebec. He directed the operations from June 27, when he reached the Isle of Orleans, until the battle on the Plains of Abraham, in which he was killed after scaling the cliffs with the utmost gallantry, Sept. 13, 1759. His body was brought to England and buried in the church of St. Alfege, Greenwich. See Abraham, Plains of; Quebec, Capture of; Westerham. Consult Life and Letters, B. Willson, 1909; Lives, A. G. Bradley, 1895; E. Salmon, 1909; J. W., Man and Soldier, W. T. Waugh, 1932.

Wolfe-Barry, SIR JOHN WOLFE (1836-1918). British engineer. Son of Sir Charles Barry, the architect, he was born Dec. 7, 1836, educated at Trinity College, Glenalmond, and trained as an engineer under Hawkshaw. He devoted himself mainly to rly. and dock work, and became engineer for the Barry rly., Tower Bridge, and important docks. He was a member of various royal commissions, and his influence led to the establishment of a standards committee in connexion with British engineering. In 1897 he was knighted, and next year took the additional name of Wolfe. He died Jan. 22, 1918.

Wolfenbüttel. Town of W. Germany, in the Land of Lower Saxony. It stands on the Oker, 7 m. S. of Brunswick. Capital of the duchy until 1753, it has a remarkable palace of the late 17th century, and many old framework buildings, e.g. the town hall (1600), a Gothic church of S. Mary of the same period, and Trinity church. Here is one of the world's most valuable libraries, with over 8,000



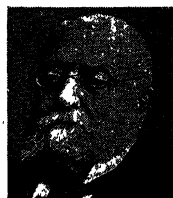
James Wolfe

manuscripts; Leibniz and Lessing were among its librarians. Lessing lived in the town from 1770 to his death in 1781 and wrote Nathan the Wise in what is now a museum. The Herman Goering steelworks here were the scene of a stiff fight, April 11, 1945, before the town fell to the U.S. 2nd armoured div. The town, itself unharmed, lay after Germany's surrender in the British zone of occupation. Pop. 34,000.

Wolff. Name of a German news agency which existed from 1849 to 1933. It was similar to and allied with Reuters in Great Britain and Havas in France. Founded by a journalist, Bernhard Wolff, it was transformed in 1874 under Bismarck's auspices into the Continental Telegraph co., whose shares were held by two private banks until acquired by the Reich in 1932. A world-wide organization, it had special facilities for acquiring and spreading news; technically independent, not subsidised by the govt., it had its own wireless transmitter in exchange for putting out govt.-inspired news and official proclamations. The Wolff agency on Jan. 1, 1934, was forcibly merged with Hugenberg's Telegraphen-Union and renamed Deutsches Nachrichten-Büro by the Nazi govt. *Pron.* Volf.

Wolff, SIR HENRY DRUMMOND (1830-1908). British diplomatist. Only son of Joseph Wolff (v.i.), he was born in Malta, Oct. 12, 1830, and educated at Rugby. He entered the foreign office at 16, and was employed in Florence, the Ionian Islands, Bulgaria, Turkey, Egypt, Persia, and Rumania. Conservative M.P. for Christchurch, 1874-80, and for Portsmouth, 1880-85, he was a member of the fourth party and originator of the Primrose League. G.C.M.G. in 1878, P.C. 1885, and G.C.B. 1889, he was British ambassador at Madrid, 1892-1900, and died Oct. 11, 1908. Among his published works were The Island Empire, 1855, a life of Napoleon at Elba; Memnon Letters on the Suez Canal; Some Notes of the Past, 1892. See Churchill, Lord Randolph; Fourth Party.

Wolff, JOSEPH (1795-1862). A missionary to the Jews. Son of an Anglo-German rabbi, he was born at Weilersbach, near Bamberg, Bavaria, and became a convert to Christianity in 1812. He visited



Sir Henry Wolff,
British diplomatist

London and entered the Church of England. He studied Oriental languages at Cambridge, and in 1821-28 served as a missionary to the Jews in the Near East. Rector of Linthwaite, Yorks, 1838, he made a journey to Bokhara, 1843, described in his *Mission to Bokhara, 1845, and Travels and Adventures, 1860*. He was vicar of Ille Brewers, Somerset, from 1845 until his death, May 2, 1862.



Joseph Wolff,
missionary to
the Jews
After Mrs. Saxe

Wolff, KASPAR FRIEDRICH (1733-94). German physiologist. Born in Berlin, he took his degree in medicine at Halle in 1759, later attracting attention with his famous treatise, *Theoria Generationis*. A surgeon during the Seven Years War, he was professor of anatomy and physiology at St. Petersburg from 1766 until his death, Feb. 22, 1794. Wolff, who is regarded as the founder of modern embryology, was the first to establish, by watching the growth of the alimentary canal in the chick, the theory of epigenesis. He also in some measure forecast the modern idea of embryonic layers. His other works include *De Formatione Intestini*, 1768.

Wolf-Ferrari, ERMANNO (1876-1948). Italian composer. Born at Venice of German and Italian parents, Jan. 12, 1876, he studied composition under Rheinberger at Munich, and made an international reputation at the end of the century. He was appointed director of the Benedetto Marcello school at Venice in 1902, but resigned in 1912 to devote himself to composition. His best-known opera, *Jewels of the Madonna*, 1911, has a lurid libretto which ill-accommodates its delicate and imaginative music. I Quattro Rusteghi has been performed at Sadler's Wells. Wolf-Ferrari, who also produced chamber music and organ pieces, died in Venice, Jan. 21, 1948.

Wolffian Duct. Duct draining the mesonephros, named after K. F. Wolff, (*q.v.*). In the development of a vertebrate each segment contains, in the body region, a coelomic sac, and each of three of these, rather anteriorly placed, grows a cord of cells which becomes hollow to form a tube and bends backwards through the tissue above the coelom. These are the pronephric tubules. They unite

and run back, one on each side of the body, to join the hind gut. They are the most primitive kidney, apart from the totally different nephridia of other forms. The coelomic sacs mentioned develop each a similar tube, which makes contact with the pre-existing tube from the pronephros. In most forms the original three then regress. The remaining duct, composed of the original one and all the secondary contributions opening into it from more posterior segments, is the Wolffian duct. It remains in all forms including man, as the vas deferens (*q.v.*).

Wolf Fish (*Anarrhichas lupus*). Group of large marine fishes, allied to the blennies. They occur in the N. seas and attain a length of over 5 ft. They are used as food fish in Norway, Greenland, and Iceland.

Wolffhound. Name often applied to the borzoi (*q.v.*) and other deerhounds used in wolf-hunting; but belonging particularly to the Irish Wolffhound (*q.v.*). See Dog.

Wolfit, DONALD (b. 1902). British actor-manager. Really named Woolfitt, he was born April 20, 1902, at Newark, Notts, and educated there and at Eastbourne. A first professional engagement was offered in 1920 at York, where he played Biondello in *The Taming of The Shrew*. Seasons with Fred Terry, Matheson Lang, Sheffield Repertory, and the Old Vic (1929-30) led to a Canadian tour with Sir Barry Jackson, and in 1933 he acted Hamlet at the Arts Theatre. After two seasons at the Stratford memorial theatre, Wolfit in 1937 formed his own Shakespearian company, which was to present London seasons, tour the provs., put on lunch-time excerpts during the battle of Britain, and play to troops overseas. In 1949 he took the Bedford Theatre, Camden Town, for a season. He was made C.B.E., 1950.

With dignity and panache, and a fine, flexible voice, Wolfit had claims to be called the greatest Shakespearian actor of his day. Apart from the magnificent and moving figure of his Lear, he excelled in the less pleasant characters: Richard III, Iago, and Iachimo were perhaps more convincing than Macbeth, Benedick, and Touchstone; though Shylock and Malvolio were drawn with sympathy. The title-roles in Volpone and The Master Builder also suited him. In 1948 he married his leading lady, Rosalind Iden (b. July 29, 1911). See Acting *illus.*

Wolfram. Official name since 1949 of the chemical element formerly called tungsten (*q.v.*).

Wolframite. An ore mineral of tungsten (*q.v.*), iron manganese tungstate, (Fe.Mn)WO₄. It varies from iron tungstate, ferberite, to manganese tungstate, hubnerite; iron replaces manganese in all proportions. The mineral occurs as reddish-brown translucent to dark brown opaque tabular crystals, also massive and bladed. The mineral has a brilliant lustre on cleavage surfaces, dull on others. Wolframite occurs in high temperature quartz veins, surrounding some granites, associated with tinstone and copper ores, as in Cornwall, Malaya, Burma, Bolivia; and in certain gold-bearing quartz veins. As it weathers easily it is rarely found in placer deposits, but may occur in eluvial deposits close to the primary source.

Wolfram von Eschenbach (c. 1165-c. 1216). German minstrel. He lived for some time at the court of the landgrave of Thuringia. His epic, *Parzival* (c. 1200-10), finest of the Grail romances, is supposed to be based on a French original, and from it Wagner obtained the libretto for his opera of the same name. Apart from this epic Wolfram is represented by a few lyrics, fragments of a long poem, *Titirel*, and the unfinished *Willehalm*. *Parzival* was put into Eng. verse by J. L. Weston, 1894.

Wolf Rock. Lone rock situated about 10 m. S.W. of Land's End, Cornwall, nearly halfway to the Scilly Islands. It is marked by a lighthouse. The rock is unique in Great Britain in being composed of phonolite. The emplacement of this mass was probably associated with the volcanic period during the Tertiary. During storms in 1948 supplies were dropped to the lighthouse keepers by aeroplane.

Wolf Spider. Name given to spiders of the cosmopolitan family Lycosidae, with 27 British species. They pursue their prey by running and do not spin webs. Many form no retreat, while others live in silk-lined burrows in the ground from which they leap out and seize passing prey. The eggs are carried in a cocoon under the abdomen until they hatch, when the young congregate on the back of the female, ultimately leaving to search for food. The tarantulas are among the wolf spiders.

Wollaston, WILLIAM HYDE (1766-1828). British physicist. Born at East Dereham, Norfolk, Aug. 6, 1766, he was educated at Charterhouse and Caius College, Cambridge, graduating as a doctor. He discovered a way of rendering platinum malleable, which was not

known till after his death. Wollaston also discovered palladium, rhodium, columbium, and titanium, and in 1802 the dark lines in the solar spectrum. He invented the reflecting goniometer and the camera lucida. He published papers on electricity, astronomy, etc., and was secretary of the Royal Society, 1804-16. He died Dec. 22, 1828. Interest on money he bequeathed is awarded annually, with the Wollaston medal, by the Geological Society for work on mineral research.



William Wollaston,
British physicist
After J. Jackson

Wollastonite OR **TABULAR SPAR**. In mineralogy, calcium metasilicate, CaSiO_3 . A rock-forming mineral occurring as tabular or fibrous crystal aggregates, it is generally white to greyish. Wollastonite is a common product of contact metamorphism in impure limestones, associated with diopside, garnet, etc.; it is found also in certain contaminated igneous rocks and in some nepheline-bearing basic ones.

Wollaston Peninsula. The S.W. portion of Victoria (q.v.) Island, N.W. Territories of Canada. To the N.W. rises Colville mt.

Wollaton Hall. Former seat of Lord Middleton in Notts, England. Regarded as one of the finest of Elizabethan houses, it was built for Sir Francis Willoughby, 1580-88. It is interesting as being probably the first house built in England with the elaborate stonework decorations borrowed from Italy. It is now the property of the city of Nottingham, from which Wollaton lies 3 m. W.

Wollin (Pol. Wolin). Island and town of Pomerania. The island, at the mouth of the Oder, covers 96 sq. m. and forms the E. barrier of the Stettiner Haff. The town is on the S. of the island. It is said to have replaced the legendary Vineta, and was a bishopric from 1140, Swedish from 1648, Prussian from 1720. A bridge connects it with the mainland. Pop. 4,982. Misdroy (Pol. Miedzyzdroje) is a seaside resort on the Baltic. Most of the island pop. of 17,000 are engaged in fishing. Wollin was in the part of Germany placed under Polish administration by the Potsdam agreement in 1945.

Wollongong. A seaport and watering-place of New South

Wales, Australia. It is 49 m. by rly. S.S.W. of Sydney. Wollongong has been overshadowed by its suburb, Port Kembla (q.v.), of recent growth, and the area is rapidly being developed as an industrial centre, exporting coal, and based upon iron and steel and electrical industries. Pop. of Greater Wollongong, 62,973.

Wolmer Forest. Heath in the counties of Hampshire and Sussex, England. Approximately $7\frac{1}{2}$ m. in length from N. to S. and $2\frac{1}{2}$ m. wide, it lies mostly in Hants, 5 m. S.E. of Alton. Formerly a crown forest, noted for red deer, it is mentioned in White's Natural History of Selborne.

Wolseley, GARNET JOSEPH WOLSELEY, 1ST VISCOUNT (1833-1913). British soldier. Born of



G. Wolseley
Histed

English ancestry at Golden Bridge, co. Dublin, June 4, 1833, he entered the 12th Foot in 1852, and fought in the Burmese War immediately. He served in the Crimean War, Indian Mutiny, and China expedition of 1860, when he was lieutenant-colonel. In command of the Red River expedition in Canada, 1870, he suppressed the insurrection of Riel and was created K.C.M.G.; and in 1873-74 he conducted the Ashanti campaign, the conclusion of which brought him a grant of £25,000 and promotion to major-general.

In 1882 Wolseley was appointed to the command in Egypt on the outbreak of the rebellion of Arabi Pasha, whom he decisively defeated at Tel-el-Kebir. For this service he was raised to the peerage as Baron Wolseley. His last active service was the Nile expedition for the relief of Gordon, 1884-85, at the conclusion of which he was created a viscount. Field-marshal from 1894, and commander-in-chief 1895-1900, he died March 26, 1913. Wolseley's writings include *The Soldier's Pocket-Book for Field Service*, 5th ed. 1886; and an autobiography, *The Story of a Soldier's Life*, 1903. "All Sir Garnet," i.e. perfect in detail, comes from his name. His title passed by special remainder to his elder daughter, Frances Garnet (1872-1936), who founded a college for lady gardeners at Glynde, Sussex. It died with her on Christmas Eve, 1936.

Wolsey, THOMAS (c. 1475-1530) English cardinal and statesman. The son of an Ipswich grazier, also by report a butcher, he distinguished himself at Magdalen College, Oxford, when very young, took orders, taught the sons of the nobility, and in 1500 received a Somerset living. Domestic chaplain at Canterbury and Calais, he was introduced to Henry VII's service by Bishop Fox. Through the same agency in 1511 when dean of Lincoln, he became a member of the council of Henry VIII, whose confidence he won. Wolsey rose rapidly, securing his position by a diplomatic triumph over Ferdinand of Spain and the emperor Maximilian by forming an alliance with France in 1514. That year he became successively bishop of Lincoln and Tournai, and archbishop of York; 1515 brought the cardinal's hat and lord chancellorship. His palace at Hampton Court was now begun.

Wolsey's great aim was to hold the balance between the two great potentates, the emperor Charles V and Francis I of France; to make England the arbiter of Europe, not by war, but by diplomatic manoeuvring. But he was perhaps already aiming at the papal throne. Though under his direction public business was dispatched and



Thomas Wolsey, cardinal and statesman
National Portrait Gallery, London

justice administered with an admirable rapidity and thoroughness, the arrogant manners and the sumptuous display of the low-born cardinal raised up enmity.

The fatal moment arrived when Henry resolved to marry Anne Boleyn. Wolsey was entrusted with the task of compelling the pope to take upon himself the onus

of annulling the king's marriage with Catherine of Aragon. When he failed to procure the king's desire, Henry turned and vented his wrath upon him. In 1529 Wolsey was dismissed from all his offices and deprived of all his honours save the archbishopric of York, and was confined to his diocese. A charge of high treason was launched against him, and while the fallen prelate was journeying south to meet his accusers, he died at Leicester abbey on Nov. 29, 1530.

In spite of the lines given him by Shakespeare, it is difficult to feel sympathy with this avaricious and arrogant man. His diplomatic triumphs were superficial and his schemes largely failed. Though he founded Cardinal College, now Christ Church, Oxford, many of the sums seized from monasteries went into his own pocket. The most unspiritual of churchmen, he also provided for his illegitimate son and daughter. But he made the monarchy powerful because wealthy, and checked any tendency to faction which might have followed the death of Henry VII. He suited his time to perfection, and admiration cannot be withheld in face of his amazing gifts of organization. See Christ Church; Henry VIII. Consult Lives and studies by M. Creighton, 1888; A. F. Pollard, 1929; H. Beloe, 1930; England's First Great War Minister, E. Law, 1916.

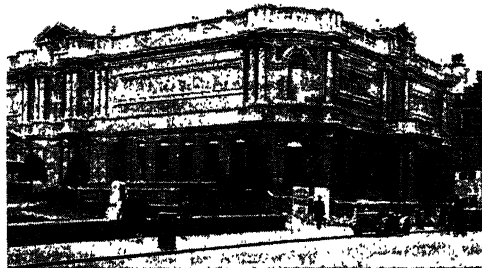
Wolsingham. Town and parish of Durham, England. It stands on the Wear and on the rly., 16 m. S.W. of Durham. Steel manufacture and agriculture are the occupations. Pop. 3,536.

Wolstanton. Eccles. parish and dist. of the bor. of Newcastle-under-Lyme, Staffs., England. Mainly residential, it has a colliery and brick and tile works.

Wolverhampton. Municipal and co. bor., and second largest town in Staffs., England. It is 13 m. N.W. of Birmingham, and is served by main rlys. The chief church is S. Peter's, a cruciformed sandstone founded in 994 and with part of its present structure dating from the 13th century; in its grounds is an ancient pillar known as the Danes' Cross. Public buildings include the town hall, municipal art gallery and museum, public library, Ban-

stock House museum and art gallery, and the magnificent civic hall opened in 1938. There are several hospitals and kindred institutions, also parks and a racecourse. Education is acknowledged to be first-class. Plans have been approved for a new civic centre within a ring road.

Wolverhampton is essentially an industrial town, but on the edge of a rich agricultural area. Locks



Wolverhampton, Staffordshire. The Municipal Art Gallery and Museum

and keys have been a special manufacture from early times, and the town also turns out pneumatic tires, rayon, aircraft and components, trolley buses and commercial vehicles, marine and Diesel engines, radio sets and batteries, ball and roller bearings, bicycles, hardware, two-stroke engines, aluminium foil and castings, machine tools, forgings, safes, and boilers. There are extensive iron and steel works, and to the S.E. are coal and iron mines. Repairing sheds of the former G.W.R. are located here. The borough charter of incorporation arrived in 1848. Wolverhampton was represented by three M.P.s up to the 1950 election, thereafter by two. Wolverhampton Wanderers are a famous football team, winners of the F.A. cup in 1893, 1908, and 1949; finalists in 1921 and 1939. Market days, Wed. and Sat. Pop. est. 158,610.

Wolverine. This bear-like carnivore of the weasel family is described under its other name of Glutton (*q.v.*).

Wolverton. Town of Bucks., England. It lies 2 m. E. of Stony Stratford, on a main rly. line and the Grand Union Canal. The church of Holy Trinity marks the site of an earlier building, and the site of an ancient castle is near. Wolverton is the educational centre of N. Bucks. There are rly. carriage and wagon works and a printing establishment. Pop. 9,521.

Woman (A.S. *wifmann*). Name given to the female of the human species. The term man, in the

sense of mankind, includes women and children as well as men. The long pregnancy of the human species, and the very long dependence of the young on the mother, gave woman in primitive communities no chance of competing on equal terms with man. Greater powers of endurance, however, compensated to some extent for her natural disabilities and her lesser physical and muscular

strength. Acquisition of a wife by abduction or capture—in theory at least giving the woman no choice—appears to have been customary in the earliest times. As mankind took to agriculture and to life in settled communities, the drudgery of the new way of life fell on the woman, compelled

by nature in any case to remain at home with her children. It was she who tilled the fields, gathered the harvest, cared for the domesticated animals, spun and wove animal and vegetable fibres into clothing, and did what simple food preserving was possible, while the man remained the hunter and the warrior protecting family and home from their human and animal enemies. The wife being now a valuable economic possession, her acquisition by purchase became usual, and remains so today in some primitive tribes in Africa and Australia.

In ancient civilizations the status of women varied. They enjoyed independence and a position of dignity in Sumeria and Babylonia; in ancient Egypt they had in general less independence, though they took part in religious observances, and a woman frequently acted as regent during a male ruler's minority. In ancient Roman law the unmarried woman remained dependent on her father or, after his death, some other male relative, the married woman on her husband. The Hindu religion placed women in a much lower position than men, teaching the observance of sati (*q.v.*) and refusing the right of re-marriage to child widows. Judaism and Islam regarded women as inferior to men; under Mosaic law and under Islam the husband only was entitled to divorce, and Islam also taught the segregation and veiling



Wolverhampton arms

present structure dating from the 13th century; in its grounds is an ancient pillar known as the Danes' Cross. Public buildings include the town hall, municipal art gallery and museum, public library, Ban-

of women. Segregation, after the Muslim conquest of N. India, spread to Hinduism, at least so far as high caste women were concerned. The woman in China had an inferior position, except in her domestic status as mother, in which she exercised authority within the home not only over her own sons, but over their wives and children also; infanticide, formerly widely practised in China, was applied to girls only. The Japanese woman had a low status, following, never walking alongside, her husband; although in Japan prostitution was an honourable profession, and no bar to subsequent marriage with the dowry earned by its practice.

The Christian religion changed the attitude of civilized communities to woman. In early Christian communities women had equality with men; women as well as men took part in religious celebrations, and suffered martyrdom. As the Church developed, embracing ideas not present in the original Christian beliefs, women lost their equality; but their right to the contemplative religious life was recognized, and they could become saints. The devotion accorded to Mary as the Mother of God led also to at least an ideal of respect and even reverence for woman, especially as mother; as souls to be saved women were never in religious theory regarded as inferior beings, though in the interest of stable matrimony the Church taught that wives should obey their husbands.

The 19th century demand by women, particularly in the U.K., for legal equality with men can probably be traced to the leisure, and boredom, forced on them by the steadily increasing impingement of machinery on home occupations. As spinning, weaving, baking, food preserving became industrial activities, workers' wives and daughters found their way into the new factories; but middle and upper class women were left with much less home claim on their labour and initiative, and therefore with a lessened status, and with time in which to give serious considerations to their wrongs and rights. They began to demand education, property rights, the franchise, and accession to the forms of work practised by their menfolk. General acceptance of the rule of law, and growing recognition of human rights, reduced the significance of woman's physical disadvantages, and made possible increasing de-



Wombat. Small nocturnal marsupial found only in Australia and Tasmania
W. S. Berridge, F.Z.S.

velopment towards equality of status between men and women in all the countries of the W. under the Christian dispensation—a development recognized more fully than anywhere else perhaps by the conscription of women for national service in the U.K. during the Second Great War.

The greater freedom achieved by women of the W. spread in some degree to non-Christian countries also: e.g. the constitution of the republic of Turkey abolished the veil, and an act of 1946 gave women the franchise; women in India were in 1948 made eligible equally with men for all state employment. See Divorce; Feminism; Man; Marriage; Marriage Law; Married Women's Property Acts; Women's Suffrage.

Irene Clephane

Woman in White, THE. Novel by Wilkie Collins, published in 1860. The plot, which concerns an elaborate conspiracy to obtain fraudulent possession of a fortune, is revealed in successive narrations by various characters, dovetailed with superb skill. The book placed Collins in the forefront of writers of mystery stories, and later writers of detective fiction owe much to his methods. The *Woman in White* is also memorable for the character of Count Fosco, a scoundrel as subtle as he is flamboyant, who has been called "the perfect villain."

Woman of No Importance, A. Comedy by Wilde, produced April 19, 1893, at the Haymarket Theatre, London, where it ran for 113 performances. As with other Wilde comedies, its theme is scandal in high society. The dialogue is consistently brilliant, the part of the worldly Lord Illingworth being enriched with some of the author's most celebrated *mots*. In the original production this part was played by Tree. The young lovers were played by Fred Terry and Julia Neilson.

Womb. Organ in the female in which the foetus is nourished and developed until birth. See Uterus.

Wombat (*Phascologydae*). Genus of marsupial mammals. Found only in Australia and Tasmania, it includes four species. Wombats are about 2 ft. long, and somewhat bear-like, with a strikingly bulky and heavy body, short broad head, small upstanding ears, and a rudimentary tail. The fur is thick and usually coarse, the colour ranging from black to yellowish brown. They live in burrows and feed at night upon grass and roots.

Wombwell. Urban dist. and town of the W. Riding of Yorks, England. Situated on the Dove, 7 m. N.W. of Rotherham, it is served by rlys. and by the Dove and Dearne Canal. Parts of the church of S. Mary are Early English. Pop. 18,365.

Wombwell, GEORGE (1778-1860). English showman. He was born at Maldon, Essex, and as a young man set up as a cordwainer in Soho. In 1804 he bought as a speculation two boa-constrictors for £75, and in three weeks more than cleared expenses by showing them. He thereupon started to build up a menagerie, which eventually became the best travelling show of its kind in Great Britain, containing some 20 lions. Wombwell died at Northallerton, Nov. 16, 1860.

Women's Army Auxiliary Corps. Body officially styled Queen Mary's Army Auxiliary Corps (W.A.A.C.). It was formed in March, 1917, and attached to the British army during the First Great War. Members were required to enlist for the duration of the war, and served as clerks, telephone operators, telegraphists, cooks, storewomen, and in ambulance and salvage work. At the time of the armistice 41,000 were serving, of whom 17,000 had been employed abroad. By the end of 1920 the corps was disbanded.

Women's Auxiliary Air Force. Body renamed in 1949 Women's Royal Air Force (q.v.).

Women's Institute. Organization of British countrywomen. Women's institutes started in Canada in 1897 when farmers' wives formed an organization for mutual information and entertainment as a counterpart to their husbands' farmers' clubs. The first W.I. in the U.K. was founded in 1915 by a Canadian, Mrs. Alfred Watt (1868-1948), at Llanfairpwllgwyngyll, Anglesey. The national federation of women's institutes was formed two years

later. The board of Agriculture and Fisheries (as it then was) recognized with a grant and other assistance the value of women's institutes in helping and teaching countrywomen to maintain food supplies during the First Great War, and continued to make a small annual grant towards working costs until 1927, after which, except for special temporary grants for particular purposes (e.g. handicraft teaching), the movement was self-supporting. There are some 7,000 women's institutes in England and Wales with a total membership of 380,000. A women's institute may be formed only in a village or small rural town. Institutes are linked in county federations, run by elected committees, and the whole movement is co-ordinated by the national federation, which also has an elected executive committee, with an advisory and educational rather than a directorial function. The movement is democratic, non-political, and non-sectarian, and is one of the few non-Catholic organizations to which R.C. women are allowed to belong. Its members are encouraged not only to amuse and educate themselves, but also to play a citizen's part in all matters of public welfare, particularly those affecting village housing and amenities and the interests of village women and children. Queen Mary and Queen Elizabeth belonged to Sandringham W.I. Scottish Women's Rural Institutes are similar.

During the Second Great War, many women's institutes ran fruit preserving centres where tons of fruit from private gardens that would otherwise have been wasted were, with the assistance of the ministry of Food, turned into jam for the preserves ration by voluntary workers; members also collected medicinal wild plants, taught handicrafts to sick soldiers, and helped to promote growing of food in gardens and allotments.

Women's Land Army. This organization is described under the heading Land Army.

Women's Mechanical Transport Service. For this service of the Second Great War, see First Aid Nursing Yeomanry.

Women's Royal Air Force. Women's auxiliary service raised in 1917 for non-combatant duties with the R.A.F. Popularly called Penguins, its members were employed chiefly as clerks, orderlies, and transport drivers, on aerodromes at home and abroad. It was disbanded in Dec., 1919.

In July, 1939, a number of companies of the Auxiliary Territorial Service (*q.v.*) which had



Women's Royal Air Force uniform of the R.A.F.

At its maximum strength the W.A.A.F. numbered 180,000. More than 95 p.c. directly replaced men, and 70 p.c. were in skilled trades. Among the technically trained personnel were flight mechanics, fitters, electricians, and radar and radio operators. Many of the barrage balloons were manned by W.A.A.F. units. Its members were also engaged on ground staff work in sector stations, chiefly in operations rooms of Fighter and Bomber Commands.

Numbers of W.A.A.F. personnel were parachuted into enemy-occupied territory as instructors in ground signalling and radio operating to the resistance movements. Others served with the R.A.F. at overseas stations, and airwomen were extensively employed as coders. After D-day, W.A.A.F. medical orderlies served in the air ambulances bringing wounded from Europe. One of the four George Crosses awarded to women in the Second Great War was won by Corporal Joan Pearson, who dragged a wounded pilot from an aircraft carrying a fused 120-lb. bomb. In the Second Great War, 187 W.A.A.F. personnel were killed on active service.

There were seven commissioned ranks in the W.A.A.F.: assistant section officer, section officer, flight officer, squadron officer, wing officer, group officer, air commandant; these ranks were equivalent to pilot officer, flying officer, flight lieutenant, squadron leader, wing commander, group captain, and air commodore in the

R.A.F. Non-commissioned ranks were like those in the R.A.F.

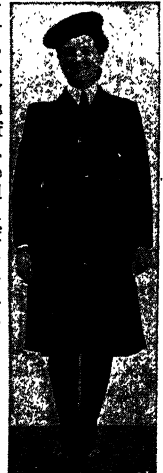
On Feb. 1, 1949, the title was altered to the Women's Royal Air Force, which became a permanent part of the R.A.F. with an establishment of 26,000. A small number are trained for non-combatant flying duties.

Women's Royal Army Corps. Official title of the Auxiliary Territorial Service (*q.v.*) from Feb. 1, 1949. The W.R.A.C. forms part of the regular army and has units in the territorial army. Special titles of rank were replaced, 1950, by their army equivalents.

Women's Royal Naval Service. Women's auxiliary service established by the British Admiralty in 1917 to release Royal Navy personnel from shore duties. In 1918 the service had a maximum strength of 5,000, personnel being employed at naval bases as cooks, clerks, orderlies, drivers, and store-keepers. The W.R.N.S. was disbanded in Oct., 1919.

At the outbreak of the Second Great War, the W.R.N.S. was formed anew to replace various categories of naval personnel. In 1944 the W.R.N.S. had a maximum strength of 75,000, and personnel were serving in more than 100 categories directly replacing men. They manned boats in harbours, acted as boarding officers to convoys, served as cipher clerks and coders at the Admiralty and on troopships, maintained the invasion barges used on D-day, and worked as meteorologists. In the Second Great War 102 "Wrens" were killed on active service.

In Jan., 1949, the W.R.N.S. was placed on a permanent basis but remained a civilian organization under Admiralty control. Women joining the service do not enlist, but enrol, and are not subject to the Naval Discipline Act. The uniform is navy blue, with commissioned and non-commissioned rank and other badges in light blue. *Consult The Story of the Wrens, E. Bigland, 1946; Blue Tapestry, V. L. Mathews, 1948.*



Women's Royal Naval Service uniform

Women's Suffrage. Exercise of the franchise by women. The vote was a chief demand in the agitation for women's rights which began in the U.K. in the 19th century, and the demand was taken up by women in other countries. Women received the municipal franchise in the U.K. in 1869; but it was 1918 before the parl. vote was conceded to them at 30, 1928 before they were given it on the same terms as men.

The first parl. vote granted to women was for the state legislature of Wyoming, 1869; other states of the U.S.A. followed from 1910 onwards, and the vote for congress was conferred on them by the 19th amendment in 1920. New Zealand women received the vote in 1893; those of Australia received it for the federal parliament under the constitution of 1902 (for the states' parliaments it came later, beginning with Tasmania, 1903); those of Canada in 1917. In Norway women received the parl. suffrage in 1912, in Belgium only in 1948.

The first English society for female suffrage was formed at Sheffield in 1867; the first national society for women's suffrage in 1867. Until the new century this and similar bodies carried on a campaign, holding meetings all over the country, but not getting into the news, for it was a cardinal point in their strategy that members must demonstrate that a woman demanding a vote remained a lady. Then, led by the Pankhurst (*q.v.*) family, the Women's Social and Political Union, which Emmeline Pankhurst had helped to found in Manchester in 1903, developed aggressive tactics.

These started in Manchester in Oct., 1905, at a meeting addressed by Sir Edward (later Lord) Grey; Annie Kenney and Christabel Pankhurst, each displaying a small banner inscribed "Votes for women," asked in turn at question time, "Will a Liberal govt. give votes to working women?" They were not answered, but were seized by stewards and thrown down the steps of the hall to the street, where, until arrested for obstruction, they addressed the crowd which collected. Given the alternative, the one of 10s. fine or seven days, the other 5s. fine or three days, they chose prison. This disturbance at a prospective cabinet minister's meeting was reported in the newspapers, and from that time the W.S.P.U. devoted itself to the invention and carrying

out of incidents which would have news value: they drove up to the house of commons in a closed furniture van, to avoid being prevented by the police from reaching their goal; they padlocked themselves to the grille of the ladies' gallery in the house, and to the railings of 10, Downing Street; from a boat on the river they harangued members taking tea on the terrace. It was five years before the "suffragettes," as the newspapers dubbed them, took to violence—smashing windows, slashing pictures, setting fire to letters in pillar boxes and to empty buildings, slapping policemen's faces, destroying golf greens. In prison they went on hunger strike, and even thirst strike.

The govt. countered such demonstrations first by forcible feeding, then by the so-called Cat and Mouse Act, 1913, under which a "suffragette" prisoner, ill through hunger striking, was released on licence, to be re-arrested when sufficiently restored to go on serving her term. Many women incurred permanent ill-health as a result of their prison experiences; the only martyr to death was Emily Davison, who died from injuries received when she threw herself in front of the king's horse at the Derby of 1913. Mrs. Pankhurst was slowly serving out a three years' sentence for felony in connexion with the blowing up of Lloyd George's Walton home when the First Great War began. The W.S.P.U. immediately stopped its campaign, and offered its services to the govt., which released all women in prison for offences in relation to suffrage activities. The vote was accorded to women of 30 under the Representation of the People Act, 1918; another Act of the same year gave women the right to sit in the house of commons. See Feminism.

Irene Clephane

Women's Voluntary Services.

British association formed on May 16, 1938, as women's voluntary services for civil defence, by the marchioness of Reading with the support of the Home office, to coordinate the efforts of existing women's voluntary organizations in the event of war, and prevent the overlapping of their activities. The largest single body affiliated to it was the national federation of women's institutes

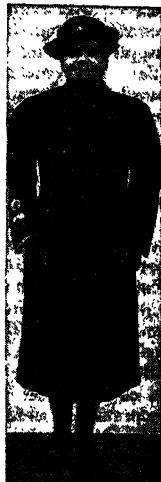
(see Women's Institute). When war came, the W.V.S. covered 65 organizations; it also began to recruit individual workers. Its

first concern was with safe removal of children and pregnant mothers from vulnerable areas; later W.V.S. personnel manned A.R.P. rest centres, supervised country nurseries for evacuated children, established and staffed service canteens, drove ambulances, organized the collection of furniture from country homes to assist people homeless in London through bombing to re-furnish, helped to man the incident inquiry points set up on the scene of heavy air raids, staffed the food flying squad vans sent into bombed areas, knitted more than a million pieces of clothing for the forces and for the children of Europe, set up 500 second-hand clothing exchanges, etc. In 1940 the W.V.S. became authorised distributor of U.S. war relief.

At the peak of its activities the W.V.S. had a maximum strength of 1,215,000. Personnel were unpaid and had no ranks, though there were certain administrative designations: e.g. county organizer, centre leader. In May, 1947, the govt. established the W.V.S. on a permanent basis. The uniform is an olive-green skirt, jacket, and hat with burgundy-coloured blouse and trimmings.

Wong, ANNA MAY (b. 1907). American film actress. Her real name was Wong Liu Tsong (Chinese, frosted yellow willow), and she was born to Chinese parents in Los Angeles, Jan. 3, 1907. She entered films and gained immediate fame by her performance in *The Thief of Bagdad*, 1924. British films in which she played included *Piccadilly*, 1929; *Chu Chin Chow*; *Java Head*; and she went on the stage at the New Theatre, London, in *The Circle of Chalk*, 1929. Back in the U.S.A. she was seen in the films *Limehouse Blues*, 1935; *Penthouse Mystery*, 1941.

Wong, WEN-HAO (b. 1889). Chinese geologist and politician. He was born in Chekiang prov.,



Women's Voluntary Services uniform



Women's Voluntary Services badge

and educated at Louvain University, studying geology. On his return to China he taught in Peking and Tsing Hwa universities, becoming during 1921-38 director of the national geological survey of China, in which capacity he wrote books soon recognized as brilliant. In the 1930s he came to the fore in politics, and was given the task of organizing China's defence industries. Minister of economic affairs in 1938, he was responsible for handling lend-lease material during the Second Great War. Vice-president of the executive yuan (i.e. vice-premier) during 1945-47, Dr. Wong was president of that body (i.e. premier) May-Nov., 1948.

Won-San. Former treaty port of Korea. It is situated on the Sea of Japan, lying 163 m. N. by E. of Seoul. Won-San possesses an extensive harbour, and was opened to foreign trade in 1883. Pop. 31,780.

Wonthaggi. Town of Victoria, Australia. It is on the coast, 86 m. by rly. S.E. of Melbourne, and is the centre of a large coal-bearing area. Pop. 5,808.

Wood (A.S. *wudu*). Area of land covered by a natural or semi-natural growth of trees, shrubs, and ground vegetation as distinct from a plantation which, as its name implies, is planted. In a commercial sense the word wood indicates the trunk and larger branches of a tree divested of bark and sawn up. Botanically, wood may be taken to mean that part of the tree trunk between pith and bark or, more exactly, the xylem elements (Gr. *xylon*, wood) of the vascular bundles which run through the roots, stems, and leaf veins of all plants. It is the perennial increase and lignification (*q.v.*) of the xylem tissue that builds up the dense woody structure forming the trunks of dicotyledonous (including hardwoods) and gymnospermous (coniferous, or softwood) trees.

A cross-section of the trunk of a dicotyledon shows distinct concentric lines or annual rings, which are made up of vascular bundles arranged concentrically between the cortex and pith, each bundle containing several kinds of specialised cells, the arrangement and number of these woody elements varying in different plants. The inner cells, long in proportion to their width, form tubes empty of protoplasm from which most of the transverse walls have disappeared, while the original cellulose of the young cell wall has

become lignified. The walls of the tubes, thickened by lignification, are covered with pits or dots, which are thin places in the cell substance through which water passes from surrounding tissues. These pitted or dotted vessels are the largest of the xylem elements and their function is to carry through the plant the water taken in by the roots. Very similar, but narrower and tapering, are the tracheids, woody, pitted cells divided by transverse walls, which also carry water. Other elements of the xylem are wood fibres—long, thick-walled, narrow cells with tapering ends which add to the strength of the wood cylinder, and wood parenchyma composed of cells filled with starch grains and shorter in proportion than other xylem cells.

The xylem of conifers differs from that of dicotyledons in being made up of tracheids, with no true vessels or wood fibres. The resin canals characteristic of conifers are often present in all parts of the plant except the xylem tissue. In some genera, however, e.g. *Pinus*, they are found in the wood, and in cross-section may be seen as narrow punctures.

The outer part of each vascular bundle, that nearest the cortex, is made up of phloem (*q.v.*) cells, long vessels containing abundant protoplasm, the transverse cell walls perforated by holes through which delicate ropes of protoplasm pass. These perforations give the name sieve tubes to the vessels, and through them are transported the sugar, proteins, etc., manufactured by the leaves. The phloem tissue contains also elongated companion cells which have no part in carrying the proteins, etc.; and to the outside of the bundle are bast fibres, long, narrow cells with lignified walls.

Between xylem and phloem lies a band of young growing cells, the cambium, which adds annually a new ring to the trunk. This, produced as undifferentiated cells, becomes on the inner or xylem side specialised and lignified as new xylem tissue, and on the outer side of the cambium ring a new layer of phloem cells. The cambium ring is sappy, especially during spring growth when the cells first formed are of a large and open texture to carry the spring rise of sap. A band of large cells marks the edge of each annual ring, the number of annual rings proving the age of the tree. Many species of tropical evergreen tree, e.g. mahogany, have, how-

ever, no seasonal change of growth rate and show no annual rings.

Between the vascular bundles there run out from pith to cortex layers or plates of thickened, lignified parenchyma cells which in a cross-section are seen to radiate from the central pith. As the trunk increases in thickness the rays increase in length, the new growth being added by the cambium ring. Starch is stored in this parenchyma tissue.

Inside the cambium ring of new growth lies the younger wood, the sapwood or alburnum; the inner rings of earlier growth become drier, darker in colour, and denser in texture, functional activity ceases in the inmost layers, and they become a dead, supporting column, while chemical changes occur, the cells being gradually infiltrated with gums, resins, oils, etc. This is the heartwood or duramen, in timber trees the most valuable part of the wood. The important timber trees are noted under their own names, e.g. Cedar; Ebony; Ironwood; Jarrah; Logwood; Mahogany; Oak; Redwood; Rosewood; Satinwood; Yellow Wood.

In monocotyledonous stems, a group including palms and yuccas, the vascular bundles resemble on the whole those of dicotyledons, but since the xylem and phloem elements are separated and there is no cambium ring adding to their thickness, they are closed bundles with no secondary growth. In most monocotyledons the bundles are irregularly distributed through the stem or trunk, so that in trees of this kind there is no increasing woody cylinder, and they form no true timber. See Forest; Forestry; Timber; Tree; Wood Pulp.

Ivy Massee

Wood, ANTHONY (a) (1632-95). English antiquary. Born at Oxford, Dec. 17, 1632, he studied at Merton College, and afterwards applied himself to collecting materials bearing on Oxford history. His MS., purchased for £100, was published in Latin by the university as *Historia et Antiquitates Univ. Oxon. 1674*. The rewritten MS. came out posthumously as *History and Antiquities of the Colleges and Halls, 1776-90*; and of the University of Oxford, 1791-96. *Athenae*



Anthony Wood,
English antiquary
From an old print

Oxonians, 1691-92, comprised biographies of Oxford undergraduates from 1500. Wood died Nov. 28, 1695. *Consult* Life and Times, ed. L. Powys, 1932.

Wood, CHRISTOPHER (1901-30). British painter. Born at Knowsley, near Liverpool, the son of a doctor, he was educated at Marlborough and Malvern colleges. A three years' illness contracted at 14 left him with a limp and constant pain. In 1920 he decided to become a painter, and during the first half of 1921 was a student at Julian's in Paris. He then wandered through most of Europe, and in N. Africa. Wood designed decor and costumes for the Diaghilev ballet *Romeo and Juliet*, 1926, and for a Cochran ballet, 1929, besides painting numerous pictures—40 in June and July, 1930. He was killed by a train at Salisbury station Aug. 21, 1930. His work was notable for clear colour, and for its childlike yet assured manner.

Wood, ELLEN (1814-87). British novelist, familiar as Mrs. Henry Wood. Born at Worcester, Jan. 17,



Mrs. Henry Wood,
British novelist.
After R. Easton

1814, her maiden name being Price, she married in 1836 Henry Wood, and spent twenty years in France before settling in London in 1856. In 1860 her novel, *Danvers House*, won a prize of £100 offered by the Scottish Temperance League. This was followed in 1861 by *East Lynne*, which achieved extraordinary success, not only as a book but in dramatic versions. Other stories include *Mrs. Halliburton's Troubles*, 1862; *The Channings*, 1862; *Dene Hollow*, 1871; *Johnny Ludlow*, 1874. After 1867, her novels appeared in *The Argosy*, of which she was the editor and proprietor. She died Feb. 10, 1887.

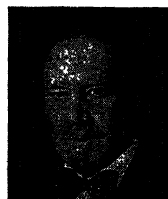
Wood, HAYDN (b. 1882). British composer. He was born at Slaithwaite, Yorks, March 25, 1882, and studied the violin, and later composition with Stanford, at the R.C.M. He toured as violinist with Albani for eight years. Of his some 200 songs the best-known are *Roses of Picardy* (a hit during the First Great War), *A Brown Bird Singing*, and *It Is Only a Tiny Garden*—sentimental ballads which had a vogue on the concert platform, and became favourites of amateur singers. A

tone-poem, *Mannin Veen* (*Dear Isle of Man*), is often played.

Wood, Mrs. HENRY. British novelist, entered as Wood, Ellen.

Wood, SIR (HENRY) EVELYN (1838-1919). A British soldier. Born at Cressing, near Braintree, Essex, Feb. 9, 1838, and educated at Marlborough, he entered the navy as a cadet in 1852, and served with distinction with the Naval Brigade in the Crimean War. Invalued home, he obtained a commission in the 13th Dragoons and went to India, where in 1858 he won the V.C. He served in the Ashanti campaign, 1874, in the Kaffir, Zulu, and Boer Wars, 1879-81, commanded a brigade in the Egyptian campaign, 1882, and during 1883-85 was sirdar of the Egyptian army, which he reorganized. He saw his last active service in the Nile expedition, 1884-85. G.C.B. in 1891, and a field-marshal from 1905, he died Dec. 2, 1919. He wrote an autobiography, *From Midshipman to Field-Marshal*, 1906; *Winnowed Memories*, 1917.

Wood, SIR HENRY JOSEPH (1869-1944). English musician. The founder and conductor for 50 years of Queen's Hall promenade concerts was born March 3, 1869, to a musical family in London, where his father was an optician. The boy learnt the organ at S. Sepulchre's, Holborn, and gave recitals before proceeding in 1886 to the R.A.M. Already he was composing cantatas and working out orchestrations. In 1888 he made his bow as a conductor, in the pit at various London theatres; he helped Sullivan to produce *Ivanhoe*, and discovered his abiding affection for Tchaikovsky's music. The promenade concerts began on Aug. 10, 1895, and Wood's work is considered in the article on them; it suffices to add that he did more for music in England than any other man of his time. Though always insisting on a large proportion of British works in his



Sir Henry Wood,
British conductor

programmes, he was early in popularising the Russians, also Brahms and Dvorak, in the U.K.

Sir Henry was knighted in 1911. He conducted at all the major festivals up and down the country. When the Queen's Hall management wished to discontinue the "proms," he took over responsibility with the aid of the B.B.C. His jubilee with the baton was celebrated with a grand festival in 1938. That year he published *My Life of Music*. Amusing anecdotes gathered about his name. Meanwhile he had sprung a joke by announcing that Paul Klenovsky, whose arrangement of Bach's toccata and fugue in D minor had been discovered by Wood, was himself. The fantasia on British sea songs had been composed for Trafalgar day, 1905, and played annually to conclude the "proms." In 1944 Sir Henry was taken ill just as the flying bombs caused the concerts to be cancelled, but went on conducting for broadcast until July 28, and died Aug. 19.

Wood, SIR (HOWARD) KINGSLEY (1881-1943). British politician. After practising for some years as a solicitor, he entered parliament as Conservative member for N. Woolwich in 1918. Parl. secretary to the ministry of Health 1924-29, he piloted the Summer Time Act, 1925, through the commons. From 1931 he was successful as postmaster-general, reducing telephone and telegram rates, and inaugurating a publicity campaign for the wider use of post office facilities. As minister of Health 1935-38, he was responsible for the Contributory Pensions Act, 1937, which enabled persons of limited means, not insured under then existing legislation, to secure widows', orphans', and old age pensions by voluntary contributions. He became Air minister in 1938, and in the Churchill govt. of 1940 chancellor of the exchequer. He died suddenly when about to bring in an emergency budget, inaugurating the pay-as-you-earn scheme, Sept. 21, 1943. Sir Kingsley was knighted in 1918.

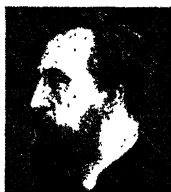
Wood, JOHN GEORGE (1827-89). British naturalist. A Londoner, he was born July 21, 1827, and educated at Ashbourne and Merton College, Oxford. Ordained in 1852, he divided his time between



Sir Kingsley Wood,
British politician

Wood, JOHN GEORGE (1827-89). British naturalist. A Londoner, he was born July 21, 1827, and educated at Ashbourne and Merton College, Oxford. Ordained in 1852, he divided his time between

literary and clerical work. After serving as chaplain at S. Bartholomew's Hospital, 1856-62, he resigned and devoted the rest of his life to lecturing



Rev. J. G. Wood,
British naturalist

and writing on natural history, his books including *Natural History of Man*, 1868-70; *Insects at Home*, 1871; *Half-hours with a Naturalist*, 1885; *The Zoo*, 1889. Wood died at Coventry, March 3, 1889.

Wood, MATILDA CHARLOTTE (1833-1915). British actress, better known as Mrs. John Wood. Born in



Mrs. John Wood,
British actress

Liverpool, she made her stage debut at Southampton in 1841, but scored her first great success in burlesque in the U.S.A., appearing at Boston in 1854. Returning to England twelve years later, she played Miss Miggs in *Barnaby Rudge* at the Princess's. In 1869 she took over the St. James's Theatre, which she ran successfully for four years. After this, at the old Court Theatre, she made a series of successes in Pinero farces. She played for the last time in 1905 in *The Prodigal Son*, at Drury Lane. She died Jan. 11, 1915.

Woodard Schools. Group of 16 English public schools, including Ardingly, Hurstpierpoint, and Lancing (*qq.v.*). A scheme to start a series of good schools for the children of middle-class parents was first advanced by Nathaniel Woodard, then an obscure clergyman, in 1848. In the same year Woodard started S. Nicholas's school, Shoreham, which later found a new home at Lancing. When he died in 1891 there were ten of his schools in existence, and a corporation was established to govern them. Others were later opened, for both boys and girls. Consult *Story of Woodard Schools*, K. E. Kirk, 1937.

Woodbine or **WOODBIND.** Name originally of general application to twining plants, but lately almost restricted to the Honeysuckle (*q.v.*).

Woodbine Willie. Nickname of the Rev. G. A. Studdert Kennedy. See *Kennedy*.

Woodbridge. Market town and urban dist. of Suffolk, England. It stands on the Deben, 10 m. from

its mouth, and has a rly. station 80 m. N.E. of London. The chief building is the fine Perpendicular church of S. Mary the Virgin. An old grammar school is now housed in large modern buildings, and there is a hospital. Woodbridge is chiefly an agricultural centre. Edward Fitzgerald lived here for many years. A religious house was founded here in the 12th century; in the 16th Thomas Seckforde built an abbey on its site. Woodbridge and Sudbury is the name of a co. constituency. Pop. 5,101.

Woodcarving. Art of ornamenting wood with carved designs. It has been practised by almost all peoples in all eras. It flourished among the Egyptians, of whose work some wonderful pieces still exist, and among the Greeks and Romans. Its most flourishing period, however, coincided with the great days of Gothic architecture, 12th to 15th centuries, and to it belongs much of the magnificent carved work, choir stalls, screens, etc., seen in European cathedrals and churches, and much decorative work in secular buildings. Later, carving was directed more to household furniture, and existing carved chests, chairs, etc., of the 16th and 17th centuries show the excellence of much of this work. Grinling Gibbons (*q.v.*) is regarded as the greatest of English woodcarvers. Oak is the most suitable wood, but chestnut, mahogany, and walnuts are used.

Woodchuck. Popular name of a species of marmot occurring in N. America. See *Marmot*.

Woodcock (*Scolopax rusticola*). British wild bird. Belonging to the plover tribe, it is closely allied to the snipe. The plumage is reddish-brown barred and striped with black on the upper parts, and pale brown barred with darker brown below. Its long and straight beak is a characteristic feature. The bird is about 14 ins. long. It

occurs in most parts of Great Britain, the majority of the birds being winter migrants. The nest consists of a hollow in the ground, among dead leaves on the borders of woods. The woodcock keeps under cover during the day, and visits its feeding-grounds at dusk.



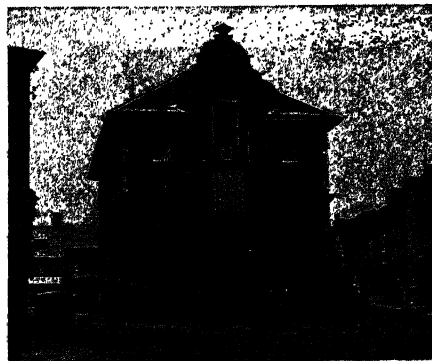
Woodcock. Long-beaked British game bird of the plover tribe

Its food consists mostly of worms and grubs procured by probing damp soil with its beak. The bird is highly esteemed for the table.

Woodcraft. The knowledge of forest conditions and open-air phenomena which enables human beings to supply themselves with the essentials of life in the wilderness. Primitive peoples are expert in woodcraft, as it enables them to make tools and weapons, prepare skins for clothing, produce baskets and cooking utensils, build and maintain fires, and track down animals for food. An expert woodcraftsman knows every type of tree and plant. He can protect himself from animals, forecast the weather, and make long journeys without a compass. Woodcraft reached its highest degree as a science during the colonisation of America, when the pioneers were forced to fend for themselves. They learned much, in both N. and S. America, from the native Indians. Because it teaches self-reliance, woodcraft is the basis of training for boy scouts, and the Woodcraft League in the U.S.A.

Woodcut. Popular name for a Wood Engraving (*q.v.*).

Woodcuts. Hamlet of Dorset, England. The site of a prehistoric



Woodbridge, Suffolk. The Town Hall

village, it is 6 m. N.W. of Cranborne. With neighbouring villages (Rotherley, Woodyates) it was dug 1884-90, when bronze and iron implements, Samian ware, Roman coins, and hypocausts attested the Romano-British occupation of a pre-Roman settlement.

Wood Distillation. Process by which wood is broken up or converted into various substances. When wood is subjected to

destructive distillation it yields many valuable products, the chief being pyroligneous acid (crude acetic acid), acetone, wood naphtha, and tar oils. Charcoal remains behind in the retort. The substances obtained vary according to the wood, pinewood yielding more tar and less pyroligneous acid than hard woods. See Distillation; Distilling.

Wood Engraving. Printing process. It is often called woodcut, since the wood engraver obtains his block by cutting away, with a tool called a graver, the wood (usually boxwood, which has a particularly close grain, though coarser woods are also used) to a certain depth from all the blank portions between and around the lines or black masses of his design, leaving those lines or masses standing in relief, and so preserving a surface from which a print can be taken. There is, however, another method, the white line method, by which the above process is reversed, the lines being cut into the block, instead of the wood between them being cut away, and thus printing white, like a chalk drawing on a blackboard. Bewick (*q.v.*) was the chief British exponent of this style.

Wood engraving is of great antiquity. In the first half of the 16th century the art flourished in Germany and the Low Countries. In Italy it was used chiefly for chiaroscuro prints, which process is virtually identical with that of colour-printing from relief-blocks at the present day. But in England after 1630 wood-cutting was largely ousted by metal engraving until temporarily revived c. 1784 by Bewick, who introduced the graver instead of the knife as the cutting tool. About 1860 there was a great revival, encouraged by the brothers Dalziel and others, in the art for book and magazine illustrations. See Drawing; Engraving; Illustration. Consult A Brief History of Wood Engraving, J. Cundall 1895.

Wooderson, SYDNEY CHARLES (b. 1914). English runner, born in London, Aug. 30, 1914. A solicitor's clerk, he joined Blackheath Harriers and by 1935 was British mile champion. Hopes that he would win the 1,500 metres race at the 1936 Olympic Games were disappointed when an injured ankle let him down. On Aug. 28, 1937, at Motspur Park, he set up a world record for the mile in 4 mins. 6.4 secs. (since beaten by Swedish runners, and by Wooderson in 4 mins. 4.2 secs.). He followed this

next year with the fastest half-mile in 1 min. 49.2 secs., and the best three-quarter in 2 mins.



Sydney Wooderson,
English runner

another runner had jostled him. In 1946 Wooderson broke the British 3-mile record in 13 mins. 53.2 secs.

Woodfall. Name of an English family of printers and journalists. Henry Sampson Woodfall (1739-1805) conducted The Public Advertiser, 1758-93, and printed the letters of Junius (*q.v.*), and works by Pope and Thomson. His brother William (1746-1803), friend of Garrick and Goldsmith, edited The London Packet, 1772-74; and in 1789 established The Diary, the first journal to publish parliamentary debates on the morning after they had taken place.

Woodford. Part of the urban dist. of Wanstead and Woodford, Essex, England. On the edge of Epping Forest, it is 11 m. N.E. of London, and is served by rly., bus, trolley bus, and Green Line. S. Mary's church was restored in the 19th century. Woodford Wells and Woodford Green are residential parts. Woodford gives its name to a bor. constituency, for which Winston Churchill sat from 1945. Pop., with Wanstead, 60,000.

Woodforde, SAMUEL (1763-1817). British artist. Born March 29, 1763, at Castle Cary, Somerset, he studied at the Royal Academy, first exhibiting in 1784. After travelling in Italy, he settled in London in 1791. Among his works are A Vestal; The Soldier's Widow; Pan Teaching Apollo. He became A.R.A. in 1800, and R.A., 1807. He died July 27, 1817.

Woodfull, WILLIAM MALDON (b. 1897). Australian cricketer, born in Victoria, Aug. 22, 1897. Striking performances for his state won him a place in the team which toured England in 1926, when he made centuries in the Leeds and Manchester test matches. He thrice passed the hundred when England returned the visit, and in 1930 was made Australian captain, as he remained until 1934. Opening the innings, Woodfull was extremely difficult to get out; almost, throughout two seasons

nobody clean bowled him. The controversy over "body-line" bowling came to a height during his leadership.

Woodgate, (HUBERT) LESLIE (b. 1902). British musician, who was born April 15, 1902, and educated at Westminster and the R.C.M. After a period as secretary to Roger Quilter, he went in 1929 to the B.B.C., where his name was to become a household word as director of the chorus. Two compositions, Hymn to the Virgin, and The White Island, received a Carnegie award in 1923; he wrote chamber music and part songs. An oratorio, Simon Peter, was performed 1949.

Woodgate, WALTER BRADFORD (1840-1920). British oarsman. Born Sept. 20, 1840, he was educated at Radley and Brasenose College, Oxford. On three occasions he rowed in the winning boat of the university pairs, won the O.U.B.C. sculls in 1861 and 1862, and was a member of the winning crew against Cambridge in 1862 and 1863. He was called to the bar in 1872, and published several works, among them the Badminton Library vol. on Boating; and Reminiscences of an Old Sportsman. He died Nov. 1, 1920.

Wood Green. Bor. of Middlesex, England. It lies N. of Hornsey, W. of Tottenham, S. of Southgate, E. of Finchley. It has some industry, including a sweet factory, but is chiefly a residential suburb of London, with communications by rly., tube rly., bus, and trolley bus. Pop. est. 52,290.

Woodhall Spa. Urban dist. and inland watering-place of the Lindsey div. of Lincs, England. It is 6 m. by rly. S.W. of Horncastle. The place is frequented for its bromo-iodine springs, discovered in 1811. It has a championship golf course, and in Jubilee Park are an open-air swimming bath and other sports facilities. Agricultural shows, gymkhanas, and flower shows are held. Pop. 1,372.

Woodhenge. Prehistoric circle in Wilts, England. Standing 2 m. N.E. of Stonehenge, it consists of six concentric circles of wooden uprights, the outermost of which contained 60 posts and was 144 ft. in diam. It was surrounded by a ditch and an outer earthen bank, now ploughed out. The socket holes of the posts were discovered from the air in 1925, and the monument was then excavated. It is dated to the time of the beaker folk who arrived in Britain c. 1900 B.C., shortly before the Bronze Age.

Woodlouse. Member of a group of Crustacea, constituting the family Oniscidae of the order Isopoda. Woodlice are unusual for this group in being terrestrial in habit. Usually brownish or slaty-grey in colour, a woodlouse has one pair of evident antennae, seven pairs of walking legs; and the abdominal limbs are used for breathing air. In some kinds the fore pairs of these limbs bear air tubes, suggesting a resemblance to the tracheae of insects. The jointed nature of its shell or carapace enables one species to roll up into a little ball when disturbed. Nocturnal in habit, it likes situations among decaying vegetation or leaf-mould, and under bark, stones, logs, boards, plant pots, etc. Some kinds occur in great numbers in commercial greenhouses, where all parts of seedlings, young or tender plants, may be attacked. The common British species are *Oniscus asellus* and *Armadillidium vulgare*.

Woodpecker (Picidae). Family of picarian birds. They are distinguished by feet adapted for climb-



Woodpecker. Three British species. 1. Lesser spotted. 2. Green. 3. Greater spotted.

W. S. Herridge
F.Z.S.

ing, and a modification of the barbed tongue which enables it to be thrust forward to extract insects from crevices. They include numerous species, found in virtually all temperate and tropical regions, with the exception of Australia and the Pacific Islands. In Great Britain there are three species.

The green woodpecker (*Picus viridis*) is common in S. and mid-England, but is rare in Scotland and Ireland. The plumage is olive-green on the upper parts, crimson on the crown of the head, black on the face, yellow on the rump, and greenish-grey below. It excavates a hole in a tree-trunk as a nesting site, usually selecting a rotten tree.

The greater spotted woodpecker (*Dryobates major*) is smaller and less common. The plumage is black on the upper parts, crimson on the back of the head, and white and crimson below. The bird is rare in Scotland, and is a winter migrant to Ireland.

The lesser spotted woodpecker (*D. minor*) is about 5 ins. long, and has the plumage black on the back, wings, and tail, with bars of white; bright red on the crown; and dusky white on the lower parts. Its distribution is similar to that of the last-named species. See Eggs, colour plate.

Wood Pigeon (*Columba palumbus*). Alternative name for the Ring Dove (*q.v.*).

Wood Pulp. Material manufactured by the disintegration of wood, and chiefly used in paper making. The wood is disintegrated either by mechanical means or by chemical action. Fir, spruce, poplar, aspen, and hemlock are the woods chiefly employed, and the wood by mechanical disintegration is ground under water, but the fibres so produced are shorter than those obtained chemically, and the pulp itself produces an inferior kind of paper. In the chemical preparation of the pulp the wood is boiled under pressure, after having the knots and bark removed and being cut in small cubes about $\frac{1}{2}$ to $\frac{3}{4}$ in. in size, and bruised between rollers. The boiling solution is either bisulphite of magnesium or calcium, or sulphate of soda. See Lumber; Newfoundland: Paper.

Woodruff (*Asperula odorata*). Perennial herb of the family Rubiaceae. A native of Europe and N. and W. Asia, it has a creeping rootstock that sends up many short stems. The lance-shaped, firm, smooth leaves are arranged in whorls at intervals up the stem. The tiny white funnel-shaped flowers are clustered at the top. The whole plant in drying gives off the fragrance of new-mown hay.

Wood Rush (*Luzula sylvatica*). Perennial herb of the family Juncaceae, indigenous to Europe. It has a short tufted rootstock with runners. The stems are about



Wood Rush. Left, clustered flowers; right, leaves

two feet high, with a few short leaves, and the leaves from the rootstock are grass-like, often a foot long, slightly fringed with silky hairs, and channelled down the middle. The pale brown flowers are very minute, in loose clusters.

Woods, MARGARET LOUISA (1856-1945). British novelist and poet. Born at Rugby, daughter of G. G. Bradley, later dean of Westminster, she married in 1879 H. G. Woods (1842-1915), afterwards president of Trinity College, Oxford, and master of the Temple. She made a great impression with her realistic novel, *A Village Tragedy*, 1887. Lyrics and Ballads, 1889, showed her poetic gifts. There are fine passages in a poetic drama, *Wild Justice*, 1896. Collections of verse appeared in 1907 and 1911. Other books were *Come Unto These Yellow Sands*, 1914; *Esther Vanhomrigh*, 1923; *The Spanish Lady*, 1927. M. L. Woods died Dec. 1, 1945.

Wood's Halfpence. Term given to the copper coinage, amounting to £108,000 in value, which Robert Wood, an English ironmonger, circulated in Ireland. He purchased the rights from the duchess of Kendal, mistress of George I, to whom the patent had been granted in 1722. In spite of the undoubted shortage of copper, the Irish people regarded the amount of copper to be put in circulation as excessive, and the strongest opposition developed, Swift taking a leading part with his celebrated *Drapier Letters*. In 1725 the patent was revoked.

Woodsia. Genus of ferns of the family Polypodiaceae. Natives of the N. temperate and Arctic regions, the Andes, and S. Africa, they have short tufted rootstocks, and the frond-stalk is usually joined near the base. The leafy portion is cut into leaflets (pinnae) from the sides. There are from three to five heaps of spore



Woodruff. White flowers of this fragrant herb



Woodsia. Fronds and roots of *W. ilvensis*

capsules on the back of each pinna, each enclosed in a bag which splits up later into hairlike segments.

Wood's Metal. Alloy with a melting point (70° C.) well below those of the constituent metals. Its composition is about 4 parts bismuth, 2 parts lead, and one each tin and cadmium. It is used for low-melting safety fuses for electric kettles; automatic anti-fire sprinklers built into ceilings; jokers' teaspoons which melt when placed in hot tea. See Alloy.

Wood Sorrel (*Oxalis acetosella*). Perennial herb, member of the family Geraniaceae. A native of



Wood Sorrel. Flowers and trifoliate sensitive leaves

Europe, Asia, N. Africa, and N. America, it has a slender, creeping, scaly rootstock, from which the leaves and flowers arise direct, on long slender stalks. The leaves are divided into three heart-shaped leaflets, after the manner of a clover-leaf. These leaflets fold, and droop close to the stalk in darkness and rain. The solitary flowers, nearly an inch across, are white, delicately veined with purple. See Leaf; Oxalic Acid.

Woodspring Priory. Remains of an Anglo-Norman building near Weston-super-Mare and the Bristol Channel, Somerset, England. It was founded in 1210, traditionally by William Courtenay, grandson

of one of Becket's murderers, as an expiatory chapel. Here was found the Becket cup, and here may still be seen the tower, tithe barn, fish pond of the monks, and spring from which the priory was named.

Woodstock. Mun. bor. of Oxfordshire, England. It is 72½ m. N.W. from London on the rly., the station being known as Blenheim and Woodstock. It is a centre of the glove-making industry, and has a history going back to the time of Ethelred II. The chief building is the church of S. Mary Magdalene. Of its famous manor house, built by Henry I, the last vestige disappeared in 1723,



Woodstock arms

soon after the completion of Blenheim (q.v.). Fair Rosamund (q.v.) is said to have lived at Woodstock in a bower built for her by Henry II. In the town the Black Prince and other princes were born, and Elizabeth was a prisoner, 1554. Chaucer's house, until about 1570 called Hanwell House, is said to have

been part of the estate of the poet's grand-daughter. Pop. 1,850.

Woodstock. Town of New Brunswick, Canada. It stands on the St. John river, 64 m. W. of Fredericton, and is a station on the C.N.R. and C.P.R. It is the centre of a farming dist.. Pop. 3,593.

Woodstock. Town of Ontario, Canada. It is on the Thames river in Oxford co., 87 m. S.W. of Toronto, and is on the main lines of both C.P.R. and C.N.R. There are machine shops, while furniture, organs and pianos, hardware, and textiles are made. Around Woodstock is a rich dairying and agricultural district. Pop. 12,461.

Woodstock, or THE CAVALIER. Twenty-second of the Waverley novels, by Scott, published 1826. It is a tale of Charles II's exile, flight, and return, with its main interest centred in the family of Sir Henry Lee, the Cavalier and Ranger of Woodstock. The plot was unconsciously followed by Thackeray in Esmond.

Wood Street. London thoroughfare, E.C.2. It opens N. from

Cheapside to London Wall between Gutter Lane and Milk Street. A plane tree at the S.W. corner marks the site of the church of S. Peter, West Cheape, destroyed in the Great Fire of 1666. The church of S. Alban, E. side, was rebuilt by Wren, 1685, and also that of S. Michael, Huggin Lane. In Silver Street, W. side, Shakespeare lodged in 1604. Cheapside Cross stood at the S. end; the Compter prison on the E., 1555-1791. Fires here in 1863, 1882, and 1887 caused damage estimated at £100,000, £1,000,000, and £240,000 respectively. On Sept. 7, 1915, bombs from a Zeppelin set some warehouses on fire. Nearly all the buildings were destroyed by air raids in 1940. The Reverie of Poor Susan, by Wordsworth, begins, At the corner of Wood Street.



Woodstock, Oxfordshire. Church of S. Mary Magdalene

Wood Swallow or SWALLOW SHRIKE (*Artamus*). Genus of about 17 species of birds, natives of the Indian sub-continent, Australia, and the intervening countries. Their family relationship has not been determined satisfactorily.



Wood Swallow, the masked species
W. S. Berriidge, F.Z.S.

They have a long, pointed, and slightly curved bill with wide gape, long wings, and a short tail. They are black, blue, grey, or rufous above, and more or less white beneath.

Wood Tin. In mineralogy, a variety of cassiterite (q.v.), tin oxide. It occurs in reniform masses, having a compact fibrous internal structure showing concentric bands resembling wood.

Woodville, ELIZABETH. The queen of Edward IV of England is entered under her Christian name on p. 3029.

Woodville, RICHARD CATON (1856-1927). Anglo-American artist. Born in London, Jan. 7, 1856,



R. Caton Woodville,
Anglo-American
painter

son of a Baltimore artist, he studied at Düsseldorf. As a war artist he saw much service in the East, especially in Turkey, 1878, and Egypt, 1882, and he was a frequent and popular contributor to English illustrated journals. From 1879 he exhibited battle pictures regularly at the R.A. He published *Random Recollections*, 1913, and died Aug. 17, 1927. See *Balaclava*; *Blenheim*; *Spion Kop*.

Woodward, SIR ARTHUR SMITH (1864-1944). English geologist. He was born at Macclesfield, May 23, 1864, and educated at its grammar school and Owens College, Manchester. He entered the British Museum in 1882, was appointed assistant keeper of geology ten years later, and from 1901 to 1924 was keeper of that department, succeeding Henry Woodward—no relation. He made valuable journeys to S. America and Greece for the collection of fossils, and in 1912-14 he was associated with Charles Dawson in his discovery near Lewes of the Piltdown skull, considered by many authorities to be the earliest ancestor of modern man. This discovery was described in *The Earliest Englishman*, new ed., 1945. Woodward was knighted on his retirement in 1924, and was honoured by learned societies of Europe and America. He published *Outlines of Vertebrate Palaeontology*, 1898, and arranged the British Museum catalogue of fossil fishes, 1889-1901. Woodward died Sept. 2, 1944.

Woodward, SAMUEL PICKWORTH (1821-65). British naturalist. He was born at Norwich, Sept. 17, 1821, and in 1848 entered the service of the British Museum, where he held important positions in the department of geology and mineralogy. His *Manual of the Mollusca* was long the standard work on the subject. He died July 11, 1865.

Wood Wasp (Siricidae). Large, brilliantly coloured insect of the order Hymenoptera. It is without a waist, and the female has a long, stout, sting-like ovipositor used for boring into wood to deposit the eggs. The larvae bore and feed in wood, often causing damage. The

black and yellow *Sirex gigas* is the commonest kind in Great Britain; others are metallic blue; all are associated with conifers. Wood wasps are closely related to sawflies (Symphyta).

Woodworm. Popular name for the larvae of various longicorn and lamellicorn beetles, as *Xestobium*, etc., which feed in wood. See *Beetle*; *Longicorn*.

Woody Nightshade. For this plant, see *Nightshade*.

Wookey Hole. Cave in limestone near Wells, Somerset, England. It is 500 ft. long. In it have been found Palaeolithic implements and fossil bones of the reindeer, mammoth, woolly rhinoceros, and cave bear. Some flint instruments are probably Mousterian; bone arrow heads are of later date. Renewed exploration from 1910 proved still later occupation during late-Celtic and Romano-British times, 200 B.C.-A.D. 400.

WOOL: ITS PROPERTIES AND USES

F. V. DAVIES, H. WATSON, and V. E. YARSLLEY

An account of the sources, properties, and economic importance of wool is followed by a brief reference to a material produced synthetically which has resemblances to natural wool. Further information on wool and its use is under Carpet; Dyes and Dyestuffs; Felt; Fulling; Sheep; Tweed; Woollen; and Worsted

Wool (O.E. *wull*) is the name given to the body-hair of certain ruminant quadrupeds, notably sheep, goats, and camels. By custom, the word is accepted as meaning the fleece of the domestic sheep, unless otherwise stated. Other animal hairs are of the same type, but are in general coarser and stiffer, and it is possible to arrange a series which passes by almost imperceptible stages from the finest and softest merino wool through coarser wools; mohair; cashmere; and horsehair, to the rigid bristles of the hog.

Wool, like other hairs, has a complex organized structure, with roots contained in depressions or follicles in the skin, and projecting shafts—the hairs themselves. The core of the wool fibre consists of numerous spindle-shaped cells, cemented together parallel to the length of the fibre. In coarser varieties there may be a cylindrical central canal or pith, the medulla, containing some air-spaces and the colouring-matter of dark wools. The core is entirely covered by a layer of horny scales which overlap one another like tiles on a roof, thus combining protection of the more delicate core with flexibility.

Australia is the world's biggest wool-producer, supplying fine merinos and high-quality cross-breeds; New Zealand supplies mainly high-quality cross-breeds; in both lands mixed breeding between merino and English-type sheep gives the cross-bred types. The Cape, the U.S.A., and various S. American countries are also considerable wool-growers.

Sheep are normally sheared yearly, and the fleeces form the most important source of wool, but skin-wool or "slipe" is also removed from the skins of slaughtered sheep; the slight

putrefaction which occurs in the first stages of fellmongering serving to loosen the wool roots. Lambs may be sheared in the first few months, and give very soft fine wool. The first clip from sheep is termed hogg wool; subsequent yearly clips are wether.

Wool auctions are held in the countries of origin, and the wool is sorted in the purchasing country. Wool-sorters classify raw wool by quality numbers, originally based on the finest yarn-count to which the various wools could be spun. This is not now strictly true, but the use of the system is well understood in the trade. General appearance and even smell guide the expert wool-sorter; but the essential in assigning a quality number is a highly developed sense of touch, making possible discrimination between wools varying by extremely small amounts; two common divisions of merino are 64s and 70s quality, which differ by less than 1/10,000 inch in diam. The finest wools are the merinos or botanias, of quality 60s, 64s, 70s, 80s, and 90s. Cross-breeds vary from 40s to 58s; the coarsest wools may be 32s and 28s.

Raw wool contains the salts derived from the animal's perspiration, chiefly potassium carbonate; and a fatty material called wool-grease. These two may account for about half the weight of the fleece, and are removed at some stage in the processing by washing or scouring. The wool-grease may be recovered from the scouring liquors, and on purification forms wool-fat or lanolin, used as a base for ointments and skin creams, and to prevent rust on steel or iron.

Wool is used for textiles in three ways: spun into two different and contrasting types of yarn, woollen and worsted, and consolidated



Wool. Processes in its preparation in Australia. 1. Shearing sheep by machinery. 2. When the fleece is shorn it is picked up in one piece and thrown on to the wool table. 3. Wool rolling and classing in a wool store. 4. Combing machine used for shorter-staple wools, removing short fibres, burrs, and grass seeds. 5. Warping wool at a textile factory, where fine quality serges and worsteds are produced from merino wool

Australian News and Information Bureau

into a sheet, called felt, without spinning or weaving.

Chemically, wool is the protein keratin, which also forms horns, finger-nails, etc. Its structure is complex, and it exhibits both acidic and basic properties. In addition to carbon, nitrogen, hydrogen, and oxygen, it contains sulphur, which appears to form cross-links between long chains composed of the other elements. Chemical treatments which attack this sulphur modify the properties of wool and may render it useless. (The discovery that it is possible to break sulphur cross-links and rebuild them in other ways has been utilised in "cold" permanent-waving processes for human hair.) Wool is very susceptible to alkali, which first attacks the scales and loosens them, and then breaks up the core into its separate spindle cells. Care is therefore necessary in wool-scouring to avoid damage, and in laundering wool garments

the use of strong alkali and high temperature must be avoided.

One of the chief characteristics of wool is its property of shrinking and matting together under the influence of moisture, heat, and friction. This is due largely to the scale structure of the fibres, and forms the basis of the "fulling" or "milling" process for woollens, as well as the making of felts. It also results in the shrinkage and thickening of wool socks, underwear, and other knitted goods. Processes for the treatment of wool to make it "non-shrink" have become of great importance, and attained particular success with services' socks, etc., during the Second Great War. Treatment with chlorine forms the basis of many of these processes, and in all of them the aim is to treat the wool with some chemical which attacks it, but to limit the attack to the outer part of the fibre in which the scales are set.

Felting is one of the properties which give wool made into articles its distinctive behaviour; others are that of taking up 30 p.c. of its weight of water without feeling appreciably damp, and the large amount by which wool fibres stretch before they break. One of the biggest disadvantages of wool is its liability to attack by moths, carpet beetles, and similar pests, the grubs of which utilise the wool as food during their period of growth. While clothing and small articles can be protected by wrapping in paper or close cotton fabric, the effect is purely to prevent the moths getting to the wool, and the old idea that newspaper had a particular virtue due to printer's ink is not correct. Upholstery is more difficult to protect, and once infested it is often almost impossible to get rid of the pests. Chemical treatment confers lasting mothproofing, the wool becoming actually

poisonous to the grubs. (*Consult Wool Trade in English Medieval History*, E. Power, 1941; *Wilts Woollen Industry in 16th and 17th cents.*, G. D. Ramsay, 1943; *Wool*, S. Kershaw, 1945; *Woollen and Worsteds Raw Materials*, J. R. Hind, 1948; *Farming for Industry*, J. Whyte, 1948.)

F. V. Davies

ECONOMIC IMPORTANCE. The woolsack as the traditional seat of the lord chancellor in the house of lords is a permanent reminder of the importance of wool economically in medieval England. Wool is important still, for woollen manufacture employs nearly 200,000 people, principally in the W. Riding of Yorks; it uses imported wool to the value of £40,000,000 annually, and besides doing much to clothe the people of the U.K., furnishes exports of woollen yarn and manufactures, worth in 1947 £58,000,000, as well as a large part of the exports of clothing. Sheep-rearing and wool-production are still an important part of British agriculture, about one-sixth of the wool used in the U.K. being home-produced; it amounts to c. 50,000 tons out of a world production of 1,600,000.

Australia exports annually c. 500,000 tons of wool, New Zealand c. 150,000 tons; together, more than a third of the world total. Most goes to London or Boston, Mass.

Sheepskins are an important source of both wool and leather. They are a valuable by-product of mutton production. London is one of the chief centres for auction sales of woolled sheepskins. Wool is closely connected with scouring and dyeing, and is the basis of industries, such as carpet-making, that utilise waste products of the manufacture of woollen cloth.

H. Watson

ARTIFICIAL WOOL. A fibre having the capacity to absorb moisture in the same degree as wool is made from the ground nut. It contains up to 28 p.c. protein and 11 p.c. carbohydrate, and is produced thus: a spinnable solution is made in alkali containing 20-30 p.c. protein. This, like viscose, is matured for 10-50 hrs., to attain the required spinning viscosity, and is then forced through spinnerets into a coagulating bath of sodium sulphate and acid. The rope of filaments formed by combining those from a number of spinnerets is cut into predetermined lengths according to the textile—worsted, woollen, or cotton—in which it will be ultimately used. The filaments

are "tanned" by treatment with formaldehyde at low pH., and are then washed acid-free and dried. The resulting fibres are cream-coloured and crimped and are soft and wool-like to handle; colour can be improved by bleaching.

V. E. Yarsley

Woolacombe. Seaside resort of Devon, England. On Morte Bay, 5 m. S.W. of Ilfracombe, it has a magnificent mile-long bathing beach with firm sand and Atlantic rollers. There is also a golf course. Potter's Hill was presented to the nation at the silver jubilee of George V, 1935.

Woolcombing. Process of removing from wool all fibres of below a certain average of length, and of arranging the long fibres in parallels.

Wooler. Town of Northumberland, England. Situated 15 m. S. of Berwick-on-Tweed, beneath the Cheviot Hills, with a rly. station, it is an agricultural centre, and has sheep and cattle fairs. Pop. 1,505.

Woolf, (ADELINE) VIRGINIA (1882-1941). British writer.

Daughter of Sir Leslie Stephen, and sister of Vanessa Bell, she was born in London, Jan. 25, 1882, and during her youth lived chiefly in London and Cornwall. In 1912 she married Leonard Woolf



Virginia Woolf,
British writer

(v.i.), with whom she founded the Hogarth Press in 1917. With Clive Bell, Lytton Strachey, T. S. Eliot, and other writers, she formed a literary group in Bloomsbury which attained an international reputation. Her first two novels, *The Voyage Out*, 1915, and *Night and Day*, 1919, were realistic in treatment; but with *Jacob's Room*, 1922, she discarded her early manner, and like James Joyce utilised what was called the "stream of consciousness" method. She became an important influence in giving the novel a more flexible form, and her classic prose was wedded to an original and vivid technique in which mood, atmosphere, and delicate satire predominated over narrative or pictorial description. To the *Lighthouse*, 1928; *Mrs. Dalloway*, 1929; *The Waves*, 1931, and the posthumous *Between the Acts*, 1941, show her as a novelist of subtle apprehensions and power of inspiring men-

tal excitement in imaginative minds. Orlando, 1928, reveals her preoccupation with the inexorable movement of time—a theme found in almost all her work.

Virginia Woolf had a keen and catholic critical sense, at its best in articles written for *The Times* literary supplement, many of which were collected in *The Common Reader*. Other works included *The Years*, 1935 (a return to her earlier manner); *A Room of One's Own*; *Three Guineas*; *Flush* (story of Mrs. Browning's spaniel); and a biography of Roger Fry, 1940. *The Moment* (essays) and *The Haunted House* (short stories) were published posthumously. Her body was found in the Sussex Ouse, near Lewes, on March 28, 1941, it being presumed that she had committed suicide. There are *Lives* and other studies by E. M. Forster (Rede lecture), 1942; D. Daiches, 1945; J. Bennett, 1945; D. Newton, 1946; R. L. Chambers, 1948.

Woolf, LEONARD SIDNEY (b. 1880). British writer. Born Nov. 25, 1880, he was educated at St. Paul's and Trinity College, Cambridge, and was in the Ceylon civil service during 1904-11. He was editor of *The International Review*, 1919, ran the literary columns of *The Nation*, 1923-30, and from 1931 edited *The Political Quarterly*. In 1912 he married Virginia Woolf (v.s.), with whom he founded the Hogarth Press in 1917. His books include *The Village in the Jungle*, 1913; *Socialism and Cooperation*, 1921; *Hunting the Highbrow*, 1927; *After the Deluge*, vol. 1, 1931; vol. 2, 1939.

Woolcott, ALEXANDER (1887-1943). American writer and critic. Born at Phalanx, N.J., Jan. 19, 1887, he was educated at Hamilton College and Columbia university. In 1913 he joined the *New York Times* as dramatic critic, and later worked in the same capacity for the *New York Herald* and *New York World*. Later in the New Yorker his wit found more scope. During 1933-37 he broadcast over the Columbia network under the name Towncrier. Woolcott's first book, published 1917, concerned the views of Mrs. Fiske, American actress. He had a gift for telling a story, as in a study of Irving Berlin, 1925. *Two Gentlemen and a Lady*, 1928; *While Rome Burns*, 1934. Monumentally egocentric, he was caricatured as the chief figure in the play, *The Man Who Came to*

Dinner, and on one occasion played the part himself. He died in New York, Jan. 23, 1943. A study by S. H. Adams came out in 1946.

Woollen. Type of wool yarn, and fabric made from it. Woollen yarn is not, like worsted, combed to lay the fibres parallel. The web from the card is divided into a number of narrow bands by cutters revolving on a shaft, and these are then rubbed into roughly cylindrical shape by passage between two moving leather belts. The product is spun into yarn on either the mule or a ring-frame. Woollen yarn is rough, hairy, uneven, and the fibres are tangled together in all directions. Woollen cloth is often said to be "made in finishing." The typical woollen fabric, straight from the loom, is bare, thready, and unprepossessing. In finishing, the chief processes are milling or fulling; brushing or raising; and cropping or shearing. The cloth shrinks and consolidates, and usually has a short dense "nap," hiding the individual threads. Typical woollen fabrics are melton, services' uniform cloth, overcoating, billiard cloth, and flannel.

The woollen industry is centred round Batley (Yorks), in the west of England, and S. Scotland. It utilises the coarser grades of wool, which are not suitable for worsteds; shoddy and mungo, which are reclaimed wool from clippings, rags, etc.; and blends of cotton with wool. Cheap flannels may have an all-cotton warp and a woollen weft.

Even in Roman times two contrasting types of fabric were made from wool, corresponding roughly to present-day woollens and worsteds. See Worsteds.

Woollett, WILLIAM (1735-85). English engraver. Born at Maidstone, Aug. 15, 1735, he studied under Tinney in London, and at the St. Martin's Lane academy. Engravings after the landscapes of Richard Wilson were his first important work. Later he engraved West's Death of Wolfe, and other historical pictures. In 1775 he was appointed engraver to the king. Regarded as the master engraver of his time, a great innovator, the first to sell work outside England, he died May 23, 1785.



William Woollett,
English engraver

Woolley, SIR (CHARLES) LEONARD (b. 1880). British archaeologist. Born April 17, 1880, he



Sir Leonard Woolley,
British archaeologist

was educated at New College, Oxford, and became assistant keeper at the Ashmolean Museum in 1905. After excavating in Nubia for five years, he conducted the British Museum excavations on the Hittite site at Carhemish, 1912-14, and again after the First Great War. He unearthed the ancient Egyptian city at Tell-el-Amarna in 1921, then was director of the British Museum and Pennsylvania joint expedition to Iraq. Woolley's discoveries of supreme value were at the site of Ur (q.v.), carrying the history of Chaldean culture back to 3500 B.C. He gave a graphic account of these discoveries in *Ur: The Royal Tombs*, 1933, and other books. Important excavations were made at Al Mina, near Antioch, 1936-37, and in the Hatay before and after the Second Great War. Knighted 1935, Sir Leonard wrote *Digging Up the Past*, 1930; *Development of Sumerian Art*, 1935; *The Ziggurat and its Surroundings*, 1938.

Woolley, FRANK EDWARD (b. 1887). English professional cricketer. Born at Tonbridge, May 27, 1887, he played for Kent first in 1906. In 28 successive seasons, 1907-14 and 1919-38, Woolley exceeded 1,000 runs, a record, and put together a higher total than



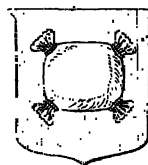
Frank Woolley,
English cricketer

had been achieved by any other player still in the game when he retired in 1939. In each of eight summers he captured 100 wickets (185 in 1920). He played in 32 test matches against Australia, the last at the age of 47; and 52 consecutive tests against all countries. Notable performances were innings of 95 and 93 in one match against Australia, 1921; 305 not out, against Tasmania; an aggregate of 3,352 in 1928; and the Lawrence trophy for the fastest century in 1934. The most graceful left-handed batsman of all time and a bowler of right-hand spinners, Woolley was England's

best all-round player before the advent of W. R. Hammond. Author of *The King of Games*, 1936, he became coach at King's School, Canterbury.

Woolman, JOHN (1720-72). American preacher. He was born at Northampton, Burlington co., West Jersey, and from the age of 23 devoted his life mainly to the anti-slavery movement, becoming an itinerant Quaker preacher and supporting himself by tailoring. In 1772 he came to England to confer with the British Quakers, but died from small-pox at York, Oct. 7. He is best known by his *Journal*, an ingenious revelation of a spiritual nature. He also wrote essays. Consult J. W., Quaker, J. Whitney, 1943.

Woolmen. London city livery company. Founded early in the



Woolmen's Co.
arms

14th century, it had ordinances confirmed in 1587 by the lord chancellor. Sir John Crosby was a member of the company. The office is at 3, Albany Court Yard, W.I.

Woolner, THOMAS (1825-92). British sculptor and poet. Born at Hadleigh, Suffolk, Dec. 17, 1825, he studied under William Behnes, and at the R.A. schools; joined the Pre-Raphaelite Brotherhood; and contributed poems to *The Germ*. In 1857, medallion portraits of Tennyson (Trinity College, Cambridge) and Carlyle established his reputation. Woolner became A.R.A. in 1871, R.A. in 1874, professor of sculpture, 1877-79. He modelled busts or statues of most of the great men of his time, e.g. that of J. S. Mill on the Thames Embankment. He died Oct. 7, 1892.

Woolsack. In the British parliament, seat of the lord chancellor when presiding over the sittings of



Thomas Woolner,
British sculptor



The Woolsack, on which the lord chancellor sits in the house of lords

the house of lords. At an early date a sack of wool was placed in the house as a seat, and in time this became the official seat. In the time of Henry VIII there is a reference to the chancellor and other high officials sitting upon sacks. Today the sack is a large square cushion of wool, covered with red cloth. Technically it is outside the precincts of the house, so that if the lord chancellor wishes to intervene in debate he must let someone else take his place for the moment and, stepping aside, speak as a peer to his peers. In this he has more freedom than the Speaker of the house of commons, who impartially controls debate. See Lord High Chancellor; Lords, House of.

Woolsey, THEODORE DWIGHT (1801-89). American education-

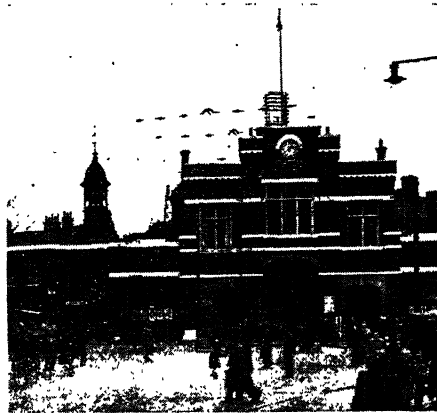


T. Dwight Woolsey,
American educationist

ist. Born in New York, Oct. 31, 1801, and educated at Yale, Philadelphia, Princeton, Leipzig, Bonn, and Berlin, he was professor of Greek at Yale during 1831-46, thereafter president till 1871. During his administration two new departments were established at Yale, the schools of science and of the fine arts. Woolsey was chairman of the American commission revising the A.V. of the Bible. He died July 1, 1889. His publications include editions of Greek plays; Introduction to the Study of International Law, 1860; Socialism and Communism, 1880; Divorce and Divorce Legislation, 1882.

Woolston, THOMAS (1670-1733). English deist. A native of Northampton, and educated at Sidney Sussex College, Cambridge, he took orders and became ecclesiastical lecturer in 1697. The study of Origen caused him to lose faith in the Bible and advocate allegorical explanation; his attacks on orthodoxy led to his being deprived of fellowship and orders. In 1729 he was convicted of blasphemy, and spent the rest of his life in prison, dying Jan. 27, 1733. He wrote *The Moderator Between an Infidel and an Apostate*, 1725; *Defence of the Miracle of the Thundering Legion*, 1726; *Discourse on the Miracles of Our Saviour*, 1727.

Woolton, FREDERICK JAMES MARQUIS, 1ST BARON (b. 1883). British business man and politician. A Mancunian, born Aug. 24,



Woolwich, S.E. London. Gateway in Beresford Square to the arsenal, established in the 17th cent.

1883, he was educated at Manchester grammar school and university, and was for a time research fellow in economics in the latter. In 1920 he became a director of the departmental store, Lewis's Ltd., of Liverpool, Manchester, and Birmingham, and was later chairman and managing director, extending the firm's activities. Having served on several govt. committees dealing with business, Marquis, knighted in 1935, became director-general of equipment and stores to the ministry of Supply at the outbreak of the Second Great War. Raised to the peerage in 1939, Woolton was minister of Food, 1940-43, then was given the new appointment of minister of Reconstruction. Lord president of the council in Churchill's "caretaker" govt. of 1945, he was, after the general election that year, appointed chairman of the Conservative party with the task of strengthening the party organization.



Lord Woolton,
British politician

Woolwich. Met. bor. of the co. of London. It is situated on the S. bank of the Thames, 9 m. below London Bridge, and is served by rly., tram, and bus. It includes the districts of Woolwich, Plumstead, and Eltham. North Woolwich, across the river, is connected by ferry and subway. In the royal dockyard, used since

1869 for military stores, the Great Harry was launched in 1515. The royal arsenal, dating from the 17th cent., occupies an area 3½ m. long by 1 m. broad, and includes a gun factory, torpedo factory, laboratory, and carriage, army ordnance, and naval ordnance departments. Munitions were turned out during both Great Wars, and normally commercial articles are also made.

At Woolwich was formerly the Royal Military Academy, founded 1741, where

officers of the artillery and engineering branches of the British army received training. This was closed in 1939, and in 1946 was amalgamated with the Royal Military College to form the present R.M.A., Sandhurst.

In the churchyard of the parish church of S. Mary Magdalene, 1740, Henry Maudslay, the engineer, and Tom Cribb, the pugilist, were buried. Gordon and Sims Reeves were natives. There are handsome municipal buildings, public library, and several theatres. Parks and open spaces cover upwards of 400 acres. Eltham Hall, famous for royal banquets, still exists, and the Tudor Barn at Well Hall has associations with More. In the 20th cent. Woolwich witnessed an enormous industrial expansion, as a result of which it was one of the most severely bombed boroughs in both Great Wars. Two M.P.s are elected. Pop. est. 140,000.

Woolworth. Name of a family of American business men. Frank Winfield Woolworth (1852-1919) was born near Rodman, N.Y., April 13, 1852, and at 27 invested his whole capital of some £60 in a store in Utica devoted to articles retailed at the "fixed" prices of 10 and 20 cents (equivalent to English 3d. and 6d.).



F. W. Woolworth,
American business man

His brother, Charles Sumner Woolworth (1856-1947), born Aug. 1, 1856, helped him, and in 1880 opened independently the second of the Woolworth stores at Scranton, Pa. The brothers engaged in friendly rivalry, running individual



Woolwich arms

chains of stores. In 1912 they joined forces and the business spread rapidly in the U.S.A. and Canada, and then to Great Britain—the most successful of a number of fixed price enterprises. F. W. Woolworth died April 7, 1919, leaving about £9,000,000, and C. S. Woolworth became chairman of the co., which at that time controlled some 800 stores in the U.S.A. and Canada and 60 in Great Britain. By 1934 there were nearly 2,000 stores in the U.S.A. and Canada and about 600 in Great Britain. The mammoth Woolworth Building, for long Broadway's highest sky-scraper, was h.q. of the enterprise. C. S. Woolworth helped many worthy causes in the U.S.A., presenting e.g. £100,000 to provide a Y.M.C.A. dormitory in Scranton. He died Jan. 7, 1947. By that date there were in Great Britain 756 stores open, and 13 others had been destroyed in the Second Great War. Changes in economic conditions had forced the abandonment of the fixed price. Much of F. W. Woolworth's fortune went to his grand-daughter Barbara Hutton.

Woomera Rocket Range. Rocket-proving ground in Central Australia. It was established in 1946 and is operated in conjunction with the rocket research centre at Salisbury, near Adelaide. The range runs from Woomera, a hamlet 240 m. N.W. of Melbourne, across 1,200 m. of desert towards the N.W. coast, and lies in an area of 3,000 sq. m. to which entrance is forbidden. By 1948 plans had been made to extend this range across 1,500 m. of the Indian Ocean to Christmas Island. A special township and airfield were built at Woomera, and a rly. laid from Melbourne at a cost of £1,000,000. Missiles are made in Great Britain and assembled at Salisbury. Throughout the missiles' flight across the range, their course is followed on a chain of radar observation posts. See Rocket.

Woonsocket. City of Rhode Island, U.S.A., in Providence co. It stands on Blackstone river, 15 m. N.N.W. of Providence, and is served by the New York, New Haven, and Hartford rly. The place was settled in 1667, incorporated after 200 years, and became a city in 1888. French is the prevailing language, for most of the workers came from Quebec to engage in spinning wool, advancing Woonsocket eventually to first place in wool manufacture in the U.S.A. Pop. 49,303.

Wooster. City of Ohio, U.S.A., the co. seat of Wayne co. It is 53 m. S.S.W. of Cleveland and is served by the Baltimore and Ohio, and the Pennsylvania rlys. It is the seat of a Presbyterian university. An agricultural experimental station farms 3,000 acres and supervises forests. Oil and natural gas provide industries, and the city has the biggest paint-brush factory in the U.S.A. Founded in 1808, Wooster was incorporated in 1817 and became a city in 1869. Pop. 11,543.

Wootton, FRANK (1893–1940). British jockey and trainer. Born in Australia, Dec. 14, 1893, he rode his first winner, Retrieve, at Folkestone, Aug. 23, 1906. In each season from 1909 to 1912 he headed the list of winning jockeys. His successes included the Oaks, 1909, and the St. Leger, 1910. After this he put on weight rapidly, and by 1914 had relinquished the occupation of jockey for that of trainer, eventually taking over his father's establishment at Epsom. He died April 6, 1940.

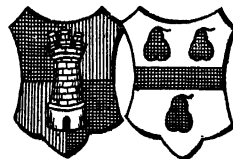


Worcester. The cathedral, from the right bank of the Severn. It dates from the 13th century

Worcester. Name of three British training ships. The second and best known was launched in 1840, as the Frederick William; a 74-gun ship of the line, she displaced 2,300 tons on a length of 214 ft. and a beam of 60 ft., and was built of oak. She served with the Royal Navy until transferred to coastguard duties in 1845. In 1876 the Admiralty lent her to the Thames nautical training college for merchant navy officers, her name was changed to Worcester, and she was moored off Greenhithe. She continued as a training ship until the Second Great War, when she was requisitioned by the Admiralty as h.q. of the Greenhithe

section of the London auxiliary patrol. In 1945 she was condemned to be scrapped. Moved to Grays, she sank Aug. 29, 1948. She was replaced at Greenhithe by the former Exmouth (*q.v.*), renamed Worcester.

Worcester. County borough, city, and county town of Worcester-shire, England. On the left bank of the Severn, and on main railway



Worcester arms

lines, 22 m. S.W. of Birmingham, the city has been the seat of a bishop since 680. On the river bank stands the cruciform cathedral of Christ and S. Mary the Virgin. Dating from the 13th century and extensively restored 1854–74, this has a fine central tower, 196 ft. in height, completed in 1374. The transepts are Norman and Perpendicular, and beyond the

crossing is a screen, by Sir Gilbert Scott, which cuts off the chancel. This and the lady chapel beyond contain carved 14th century stalls. Under the choir and aisles is a fine crypt, built by S. Wulfstan in 1084. The tombs include those of King John and Arthur, son of Henry VII. The old refectory forms part of the King's school.

Near the cathedral is Edgar Tower, all that remains of the castle and now a repository of deeds. The guildhall contains interesting civic memorials. Among many ancient dwellings is King Charles's House,

where Charles II is said to have hidden after the battle of 1651. Gloves are manufactured, and there is trade in hops, also engineering works, boot factories, and iron foundries. The bor. constituency includes Droitwich. On Worcester cricket ground touring teams usually open their season. This was "the faithful city" to the Stuarts. Market days, Mon., Wed., and Sat. Pop. est. 61,350. Consult County Town, a symposium, 1946.

Worcester. Second largest city of Massachusetts, U.S.A., and a co. seat of Worcester co. It stands on the Blackstone river, 45 m. W. of Boston, and is served by the New York, New Haven, and Hartford

ry, among others. Here is Clark university, founded 1889. Worcester leads the nation in output of textile looms and vitrified grinding wheels. Settled in 1712, it was incorporated in 1722, and became a city in 1848. Pop. 193,694.

Worcester, BATTLE OF. Fought between the English and the Scots, Sept. 3, 1651. After his coronation at Scone, Charles II left Stirling on July 31 for England, where he hoped for further support, and marching through Lancs, entered Worcester on Aug. 22. At Warwick Cromwell linked up his main army with two detachments and advanced to Evesham. The main body of the royal army was outside Worcester on the other side of the Severn, so Cromwell decided to assail both city and army at once. A bridge was made to take the troops across the Severn, and a detachment under Lambert and Fleetwood opened the battle. The Scots, forced back into Worcester, rallied, but Cromwell with fresh troops forced his way into the city, whereupon the Scottish foot laid down their arms, while the horse made their way out of the city. The numbers engaged are estimated at English, 28,000; Scots, 16,000. The well-known incident of Charles hiding in the Boscobel oak occurred after this battle.

Worcester, EDWARD SOMERSET, 2ND MARQUESS OF (1601-67). English nobleman and inventor. Son of the 1st marquess, he early took an interest in experimental mechanics and in mathematics, though his position brought him into political prominence and interfered with work. During the Civil War, having garrisoned Raglan Castle for Charles I and been made earl of Glamorgan in 1644, he raised several regiments, and was

sent to Ireland in 1645 to treat secretly with the Roman Catholics for troops to fight in England. He succeeded to the peerage in 1646, fled to France in 1648, and after his return in 1652

was two years in prison. He died April 3, 1667. Worcester's chief claim to fame is his experiments suggesting that steam power was possible. *Consult* Life, Times, and Scientific Labours, H. Dircks, 1865.

Worcester China. Porcelain was produced in the factory established at Worcester, 1751. The



Worcestershire. Map of the midland county of England, famous for its orchards

works were founded by John Dale, a scientific chemist and a good painter. Soft paste porcelain mixed with steatite was used. Early pieces include mugs with portraits printed in black, purple, and blue; tea services with transfer prints; decorative pieces with embossed flowers and medallions; and painted Chinese landscapes. See *China*ware colour plate.

Worcester College. College of the university of Oxford. It was founded in 1714 by Sir Thomas Cookes, a Worcestershire baronet, in buildings formerly occupied by Gloucester Hall, founded in 1283 for students of the Benedictine order, and dissolved at the Reformation. The buildings, some of which are very old, are in Walton Street, remote from the



Worcester College arms

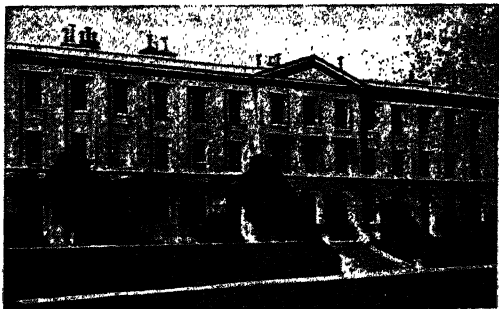
fertile, some of the valleys especially so. A large area is under orchards, plums, apples, and pears being extensively grown. Hops are cultivated, also wheat, oats, and potatoes, and there are many market gardens.

The manufacturing district in the N. around Stourport and Kidderminster forms part of the Black Country. At Droitwich are brine springs, while Malvern is a holiday centre. Main rlys. and canals serve the co. Worcester is the county town. Other places are Dudley, Stourbridge, Bewdley, Bromsgrove, Evesham, Pershore. There are three co. and three bor. constituencies. Pop. 420,056.

LITERARY ASSOCIATIONS, ETC. One of the old chroniclers was Florence of Worcester, who died in



Worcestershire arms



Worcester College, Oxford. Modern part of the college

1118. Layamon, author of *Brut*, was a priest of Areley Church, and Langland, author of *Piers Plowman*, was associated with Worcester. Samuel Butler, author of *Hudibras*, was born at Strensham; Richard Baxter, who wrote *The Saints' Everlasting Rest*, lived at Kidderminster, where there is a monument to him. The poets Shenstone and Calverley were Worcestershire men. The 1st Earl Baldwin was a native of Bewdley, and F. Brett Young of Halesowen. Broadheath was the birthplace of Elgar. *Consult* *Historic Worcestershire*, W. S. Brasington, 1893; *Victoria History*, 3 vols., ed. W. Page, 1913.

Worcestershire Regiment. Unit of the British army, formed in 1881 by an amalgamation of the



Worcestershire Regiment badge

29th and 36th Foot. Raised in 1694, the 29th won its first battle honour under Marlborough at Ramillies in 1706. In 1745 it was at the disastrous action of Fontenoy. The 36th was raised in Ireland in 1701, and first saw action in the Jacobite rebellion of 1715. After some years in the West Indies it returned, and fought in the second Jacobite rebellion of 1745. Again drafted to the West Indies, it earned the battle honours: Guadeloupe, 1759; Quebec, 1759; Martinique, 1762. A detachment of the 29th served with Howe's fleet on the Glorious First of June, 1794, for which the regt. was granted the naval crown on its badge.

Both regts. served throughout the American War of Independence, and later moved to Egypt, fighting at the Pyramids, 1801. They went with Wellington throughout the Peninsular War, earning particular distinction at Talavera and Albuera. In 1812 the 36th went to Canada, but the 29th was at Waterloo. Three honours were gained by the 36th in the Sikh War of 1845-46, and in the Crimean War the 29th earned the honours Alma, Inkerman, and Sevastopol. Both regts. served throughout the Indian Mutiny. As the 1st and 2nd bns. of the Worcestershire Regiment they were at the defence of Ladysmith, relief of Kimberley, and battle of Paardeberg. Twenty-four battalions were raised for the First Great War and gained the honours: Mons; Ypres, 1914, '15, '17; Somme, 1916, '18; Lys; Selle; Vittorio Veneto; Dorian,

1917; Sari Bair; Bagdad. In the Second Great War, battalions fought in France, 1940; N. Africa; Italy; Burma; N.W. Europe. Regimental depot is at Worcester.

Worde, WYNKYN DE (d. 1534). English printer, who came from Wörth, Alsace. His real name appears to have been Jan van Wynkyn. He is said to have assisted Caxton at Bruges, and to have accompanied him to England, where he took out letters of naturalisation in 1496. He took over Caxton's business at Westminster in 1491, set up business at the sign of *The Sunne in Fleet Street*, 1500, and removed to *St. Paul's Churchyard*, 1509. Among the 600-700 books, pamphlets, and new editions issued by him was an English version of the *De Proprietatibus Rerum* of Bartholomeus Anglicus, c. 1496, the first book printed on paper made in England. *Consult* *Early English Printing*, E. Gordon Duff, 1896.



Wynkyn de Worde, English printer

From an old print

Wordsworth, CHARLES (1806-92). British prelate. Born in London, Aug. 22, 1806, he was a son of Christopher Wordsworth (1774-1846), master of Trinity, Cambridge, and a nephew of the poet. Educated at Harrow and Christ Church, Oxford, he was ordained, and became in 1835 a master at Winchester. In 1846 Wordsworth, partly owing to Gladstone's influence, went to Trinity College, Glenalmond, as its first warden. In 1852 he was chosen bishop of St. Andrews, and he lived until Dec. 5, 1892. A reviser of the N.T., Wordsworth was famous as a classical scholar, and in early life as an athlete.

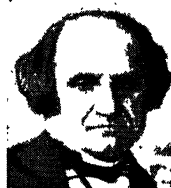
Wordsworth, CHRISTOPHER (1807-85). British prelate. Born in London, Oct. 30, 1807, he was a brother of Charles Wordsworth and a nephew of the poet. Educated at Winchester and Trinity College, Cambridge, he graduated as senior classic, was elected fellow of Trinity, and was ordained. He was also famous as an athlete. Wordsworth was headmaster of

Harrow, 1836-44; then canon of Westminster; and from 1869 bishop of Lincoln. He died March 20, 1885. A notable scholar, he wrote many hymns, e.g. *Gracious Spirit, Holy Ghost*; *Hark, the sound of holy voices*.

Wordsworth, DOROTHY (1771-1855). British author. Born on Christmas day, 1771, she was the only sister of William Wordsworth, for whom she kept house almost continuously from their first settling in Dorset in 1795. She was a devoted companion and great inspiration, but is well worth attention as an author herself. Her journals of tours in the Lake District and Scotland are full of simple but picturesque appraisal. An invalid from 1829, she died at Grasmere, Jan. 25, 1855. *Consult* *Lives*, C. M. Maclean, 1932; *E. de Selincourt*, 1933; *Journals*, ed. W. Knight, 1924; ed. E. de Selincourt, 1942.

Wordsworth, JOHN (1843-1911). British prelate. Born at Harrow, Sept. 21, 1843, a son of the hymn writer, Christopher Wordsworth, he was educated at Winchester and New College, Oxford. In 1867 he was ordained, remaining until 1885 in Oxford, except for a year when he was a master at Wellington. In 1883 he was made Oriel professor of the interpretation of Holy Scripture. For 26 years bishop of Salisbury, he died there Aug. 16, 1911. Famed as a Latin scholar, Wordsworth wrote copiously on the history of the Bible and the Church.

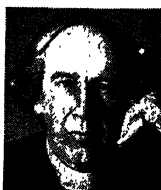
Wordsworth, WILLIAM (1770-1850). British poet. He was born at Cockermouth, Cumberland, April 7, 1770, the son of a land agent, and was educated at the Hawkshead grammar school and S. John's College, Cambridge. In



Christopher Wordsworth, British prelate



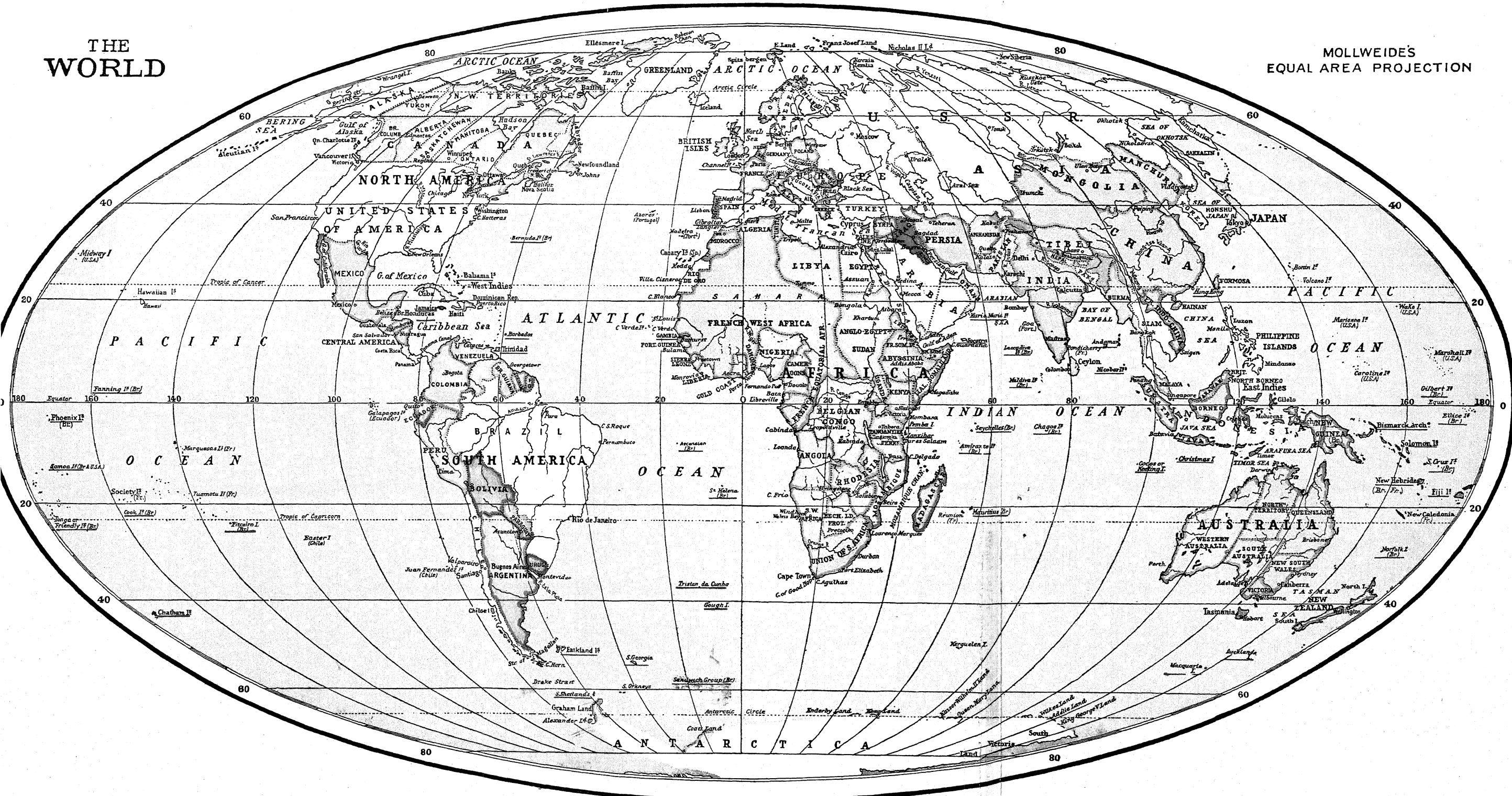
Dorothy Wordsworth, British author



John Wordsworth, British prelate

THE
WORLD

MOLLWEIDE'S
EQUAL AREA PROJECTION



MAP OF THE WORLD ON MOLLWEIDE'S PROJECTION, WHICH, BY THE USE OF PARALLELS AND ELLIPTICAL MERIDIANS, SHOWS THE ACTUAL RELATIVE AREAS MORE CORRECTLY THAN MERCATOR'S PROJECTION
To face page 8616

1790 he made a walking tour on the Continent, and next year his enthusiasm for the revolutionary cause prompted him to return to France, where he spent 13 months, and had an illegitimate daughter by Annette Vallon. He has given a full account of his connexion with the Revolution, and of other formative influences, in his autobiographical poem *The Prelude*. He opened his career as a poet in 1793 with *An Evening Walk* and *Descriptive Sketches*. In 1795 he settled with his sister Dorothy at Racedown, Dorset, whence after two years they moved to Somerset.

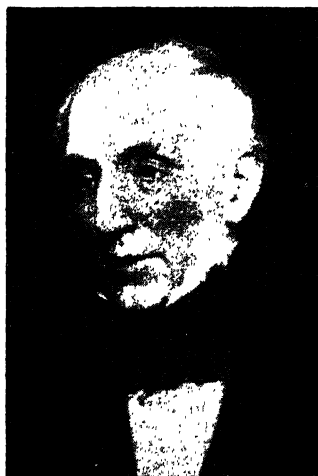
Then came the *Lyrical Ballads*, 1798, produced in conjunction with Coleridge, whose part in the joint enterprise was to show how romance could be humanised by its union with psychological truth, while Wordsworth undertook to demonstrate the poetic possibilities of subjects taken from common life. After a visit to Germany, Wordsworth in 1799 moved to Grasmere, Westmorland; in 1802 he married Mary Hutchinson; and, after three years at Allan Bank, 1808-11, he took up his residence in 1813 at Rydal Mount, his home for the rest of his life.

In 1800 he had published a second edition of *Lyrical Ballads*, with a preface in which he attacked the artificial diction of the 18th century poets, and enforced the doctrine that the richest source of poetic material is to be found in humble and rustic life. This was followed in 1807 by two volumes containing, in such poems as the *Ode to Duty* and the *Ode on the Intimations of Immortality*, some of his finest work; in 1814 by a long philosophical poem, *The Excursion*; and in 1815 by a romantic narrative in verse, *The White Doe of Rylstone*. But though he continued to write industriously, most of his really important work was now done. During 1813-42 he was distributor of stamps for Westmorland; then he was given a civil list pension, and in 1843 he succeeded Southey as laureate. He died April 23, 1850.

Value of Wordsworth's Work

Despite his marked limitations—diffuseness, pedantry, lack of humour are obvious in his writing—and the vast amount of perishable matter in his too voluminous production, Wordsworth's place among the greatest English poets is secure. Among his several hundred sonnets, some of the noblest in our language survive. He justified his famous remark that poetry is "emotion recollected in tran-

quillity." From first to last he held consistently to his conception of the poet's mission: "every great poet is a teacher," he declared; and if the didactic purpose is often too obtrusive in his verse, much of his greatness lies, as Matthew Arnold said, in his noble and profound application of ideas to life. His poetry of nature, apart from its wonderful fidelity, is specially characterised by its deeply religious quality; "the goodly uni-



Wordsworth
After H. W. Pickersgill

verse" is for him the incarnation of the Divine Spirit, and in communion through nature with this Indwelling Soul of all things, he finds consolation and spiritual strength. In his interpretation of human life he fixes his attention steadily upon the supremacy of the moral law and the sanctities of common life, seeking for "present good in life's familiar face."

Bibliography. Poetical Works, including *Life*, 11 vols., ed. W. Knight, 1882-89; *Lives*, F. W. H. Myers, 1881; W. Raleigh, 1903; W. and His Poetry, W. H. Hudson, 1914; W. in a New Light, E. Legouis, 1923; Wordsworth, C. H. Herford, 1930; *The Lost Leader*, H. I. Fausset, 1933; *The Later Wordsworth*, E. C. Batho, 1934; W.'s Pocket Notebook, ed. G. H. Healy, 1943; W.'s *View of Nature*, N. Lacey, 1948.

Work. Term used in physics. When a body is displaced by a force acting on it, work is said to be done on the body, and the measure of that work is the product of the force and the distance the body is moved in the direction of the force. Power is the rate of doing work. Units of work are expressed in foot pounds, foot tons, etc., in

the foot pound system; e.g., if a man carries 100 lb. up a ladder 40 ft. high he does 4,000 foot pounds of work. In the foot-pound-second system, the unit is the poundal; in the C.G.S. system, it is the erg, i.e. the work done by a force of 1 dyne acting through 1 cm. See *Horse Power*.

Worker. Name given to those members of each species of social insects which carry out the care of the brood, nest building, and often the defence of the colony. They are always sterile, non-reproductive individuals: abortive females in ants, bees, and wasps, while in termites they are of both sexes.

Workers' Educational Association. Voluntary organization for adult education, founded in 1903 by Albert Mansbridge (q.v.), to provide facilities for the further education of working people, in co-operation with universities and other bodies. The W.E.A. has affiliations with more than 2,000 organizations, including the T.U.C., trades councils, cooperative societies, university bodies, local education authorities, and teachers' associations. It is unsectarian, and has no party politics. It has worked closely with the extramural depts. of universities in developing university extension courses in psychology, economics, and other branches of sociology, natural science, literature, art, etc. The W.E.A. has full time local or regional organizing tutors, but most of its teachers are part time lecturers, many of them university or grammar school teachers. Its address is 384, St. George's Drive, London, S.W.1.

Workers' Travel Association. Body founded in 1921 to work in close relation with the British Labour party and co-operative movement. It specialises in arranging cheap holidays for working-class families on the Continent, and maintains fourteen guest houses in the U.K. Registered among industrial and provident societies in 1924, it has a capital of £100,000 in £1 shares, not marketable but transferable or withdrawable. No individual may hold more than 200 shares. The W.T.A. has an average turnover of £500,000 and 60,000 bookings annually. The head office is at Eccleston Court, Gillingham Street, London, S.W.1.

Workhouse. Building defined under the Poor Law Act, 1930, as a house in which poor persons were lodged or maintained or in which they received poor relief.

Originally, as the name implies, able-bodied paupers were housed in workhouses in return for the performance of given work. The Poor Law Act was repealed by the National Assistance Act, 1948. See Poor Law.

Working Party. Any group of people who undertake or are appointed to carry out a piece of social activity, e.g. the preparation of a bazaar. The term was applied specially in 1945 by Sir S. Cripps, as president of the board of trade, to denote committees appointed to inquire into and report on various industries. These working parties comprised representatives of employers and workers, together with others not directly engaged in the industry, with a chairman distinguished in some activity other than the industry. They were set up in respect of cotton, pottery, furniture, hosiery, boots and shoes, linoleum, clothing, carpets, jute, wool, china clay, jewelry and silverware, cutlery, lace, domestic glassware, milk. Inquiries brought to light shortcomings in equipment, organization, and methods of certain industries, as well as some outstanding achievements. Experience of their usefulness led to the Industrial Organization and Development Act, 1947, providing for the establishment of development councils with compulsory powers to raise the efficiency of individual industries. The cotton board was the earliest to operate of such councils.

Workington. Bor., seaport, and market town, giving its name to a co. constituency, of Cumberland, England.



Workington arms

At the mouth of the Derwent, 34 m. S.W. of Carlisle, it is served by rlys. and has a harbour. The chief industries are iron working and coal mining, the mines extending below the sea. There are shipbuilding yards, steel works, engineering works, other light industries, and some fishing. Workington Hall is interesting as having received Mary Queen of Scots on her flight from Scotland. Pop. 28,030.

Workman, WILLIAM HUNTER (1847-1937). American explorer. Born at Worcester, Mass., Feb. 16, 1847, he took his degree at Yale and Harvard, afterwards studying at Vienna, Heidelberg, and Munich, and practised medicine in his native town, 1874-89.



William Workman,
American explorer

Mt. Bullock Workman, 19,450 ft. and Mt. Kosa Gunga, 21,000 ft. Five years later they made other ascents, Workman climbing 23,394 ft. and his wife attaining the record alt. for a woman. Together they mapped W. Himalayan glaciers in 1911 and next

year explored the watershed between the Indus and Turkistan. They collaborated in books of travel. Workman died Oct. 10, 1937.

Workmen's Compensation. System in force in English law until 1946 for the payment of compensation to persons injured at work or to the dependants of persons killed. As the doctrine of common employment, which in effect prevented a man from recovering damages from an employer when injured by the negligence of a fellow employee, had caused great hardship, the Employers' Liability Act, 1880, prevented the employer from relying on the defence of common employment in certain cases; e.g. when the person by whose negligence the injury occurred was in a position of authority. Compensation recoverable was, however, limited to three years' wages.

The Workmen's Compensation Act, 1897, introduced the entirely new principle that a workman was entitled to compensation even though injury was not due to negligence at all, if it arose from an accident in the course of employment. This was improved upon by Acts of 1906 and 1925 and other amending statutes. Yet there were still serious defects. In the first place, although the Acts were expressly designed to make litigation unnecessary, they failed in this; a series of law reports confined to workmen's compensation cases of special legal importance ultimately included some 3,000 cases in nearly 50 volumes. Again, compensation was by weekly

He then travelled with his wife, Fanny Bullock Workman (1859-1925) in Africa and India. In 1899 they made several ascents in the Himalayas, including



Fanny Workman,
American explorer

payments (or a lump sum in case of death) which were related to earnings during work and in no way to needs, until slight amendments were made during the Second Great War. Weekly compensation was in general limited to 50 p.c. of earnings.

In 1942 the Beveridge Report recommended the abolition of the whole system and the substitution of a new one as part of the scheme of national insurance. In 1946 effect was given to this recommendation, the Workmen's Compensation Acts being repealed by the National Insurance (Industrial Injuries) Act. Consult Workmen's Compensation, Sir A. Wilson and H. Levy, 2 vols., 1939-41.

Work Projects Administration. One of the agencies of F. D. Roosevelt's New Deal in the U.S.A. Created in 1935, originally under the name of Works Progress Administration, in 1939 it was combined with four other concerns to form the Federal Works Agency. Its object was to provide useful occupations on public projects for the unemployed: e.g. on highways, bridges, public buildings, water supply. The W.P.A. did much to afford training in manual occupations, and to increase educational and recreational facilities. A minor service was sewing garments and making household goods.

Works, MINISTRY OF. British govt. department. It was formed in 1832 as the office of works to take charge of all royal palaces and parks, public offices, and other buildings belonging to the nation as a whole. The office remained under the control of a first commissioner until in 1940 it was raised to the status of a ministry as the ministry of Works and Buildings. It was given the additional wartime functions of erecting buildings required by other govt. depts.; arranging for non-specialised buildings for the fighting services and ministry of Supply; licensing private building and assessing priority of claims for air raid damage; and consulting with the appropriate depts. upon post-war reconstruction. The first minister was Sir John (later Lord) Reith. In 1943 the functions in post-war reconstruction of what had meanwhile been renamed the ministry of Works and Planning were taken over by the ministry of Town and Country Planning (*q.v.*) created for that purpose, the non-planning activities being retained

by the old dept. under the title ministry of Works.

Works Council. Committee representative of the management and employees of a factory, set up to provide a recognized means of consultation between them. The range of activity of such a council is normally stated precisely in its constitution; ordinarily this excludes wages and matters of agreement between a trade union and an employers' association. In 1917 the Whitley committee on relations between employers and employed recommended the establishment in each industry of national and district joint councils, and works councils. Opinions concerning the utility of the last-named vary. See Whitley Council.

Workshop. Industrial and market town and borough of Notts, England. It is on the borders of Sherwood Forest, 15 m. E.S.E. of Sheffield, and is served by rlys. and canal. Historically the centre of interest is the priory, founded here about 1100, of which survive the nave of the church of S. Cuthbert, a splendid piece of Norman work, the ruins of the lady chapel, and a 14th century gatehouse. The present manor house is modern, having replaced the one in which Mary Queen of Scots was imprisoned. The town is a mining and agricultural centre, being concerned also with timber and glass industries. Pop. 29,300.

World, THE. Word used as an alternative for earth. Usually the term has political rather than physiographical significance; or at least implies a reference to the human aspects of the habitable globe, as in the figurative phrase, the world of letters. Physically the earth is a planet, while from the historical or ecological standpoint the world is the home of man, and sum of his achievement. See Airways colour plate; British Commonwealth colour plate; Earth; Geography; Maps; Population; Rainfall colour plate; Religion colour plate; Solar System; also World colour map.

World Council of Churches. International religious organization. It was constituted Aug., 1948, at Amsterdam, when delegates from nearly 150 member-churches, representing every main Christian tradition except the Roman Catholic, met for the first assembly. Throughout a generation inter-church consultation and cooperation had been growing in volume, scope, and importance

as the accompanying table shows.

The four movements named in the table prepared the way for the

World's Evangelical Alliance. Founded 1846, to enable Christians of all nations to realize in them-

Interest	Conferences	Organization	Relation to W.C.C.
Missionary	Edinburgh 1910 Jerusalem 1928 Tambaram 1938	International Missionary Council	now in associa- with W.C.C.
Social and International	Stockholm 1925 Oxford 1937	"Life and Work"	} now repre- sented in departments of W.C.C.
Theological	Lausanne 1927 Edinburgh 1937	"Faith and Order"	
Youth	Amsterdam 1939 Oslo 1947		

World Council, but its official beginning was delayed by the Second Great War. Nevertheless, though only in process of formation, it was already engaged in notable service 1938-48. The assembly meets normally every five years, with a small central committee meeting annually, and a permanent secretarial staff at its h.q., 17, Route de Malagnou, Geneva. The council has undertaken work in the following spheres: *Faith and Order* (exploration of common ground and understanding of distinctive emphases in the various Christian traditions); *Study Department* (the sharing of thought, including that on subjects to be taken up by the next assembly); *Reconstruction, Inter-Church Aid, Refugees* (post-war relief work); *Youth* (correlation of the churches' youth work, including preparation for periodic world conferences of youth); *International Affairs* (a permanent commission, jointly with the International Missionary Council, to give expert advice to the churches).

World Digest. Monthly periodical founded, and edited until his death in 1949, by Sir John Hamerton; published in London by The Amalgamated Press. The first cheaply priced British digest, comprising extracts from the best new books and condensations of British and foreign magazine articles, it first appeared with date May, 1939.

World Food Board. Proposed subsidiary body of the U.N. Food and Agriculture Organization. Sir John Boyd Orr (Lord Boyd-Orr) proposed its creation in 1946; its chief functions were to be to stabilise world prices for agricultural products, and to create a food reserve to meet emergencies. The F.A.O. rejected this proposal, and instead set up a permanent council of the F.A.O. with advisory functions. It met for the first time in Washington, Nov. 4-11, 1947.

selves and to manifest to others the vital union which unites all believers in Jesus Christ. Incorporated 1912, the alliance is the permanent centre of international appeal on behalf of persecuted Christians and religious liberty. Freedom from political attachments qualifies it to protest to any government and secures for it a respectful hearing. The programme of practical work is devotional, missionary, and evangelistic. The temporary headquarters are at 30, Bedford Place, London, W.C.1.

World Wars. The wars of 1914-18 and 1939-45 are sometimes styled First World War and Second World War, or (especially in the U.S.A.) World War I and World War II. Throughout this encyclopedia they are called the First Great War and Second Great War. See First Great War; Second Great War.

Worm. In popular usage, word denoting any long, slender animal, whether reptile (slow-worm), mollusc (shipworm), insect (glow-worm, silkworm, wireworm, blood-worm), entozoan (tapeworm, round-worm), or earthworm. In scientific zoology the word is used to cover a heterogeneous assemblage of orders. See Ascaris; Bladder Worm; Cestodes; Earthworm; Filariasis; Fluke; Leech; Lob Worm; Nematelminthes; Nemereta; Planarians; Platyhelminthes; Serpula; Trematodes; Trichina; Wireworm.

Worm Gearing. A worm is a cylindrical rod in which is formed a deeply cut and strong thread for engagement with a corresponding thread in a worm wheel. One to four threads may traverse the worm. The latter, being driven turns the wheel relatively slowly, tooth by tooth, as the worm rotates, a common application being for reduction of speed, in which a ratio of as much as 100:1 is feasible. Another application is to secure a big mechanical advantage in order to overcome a



Worms, Germany. Cathedral of SS. Peter and Paul, dating mainly from the 11th-12th centuries, from the south-west

high resistance in the driven member. For intermittent use also worm drive is convenient. Applications are in motor car transmission; crane drives; reduction of speed in electric motors; in devices for opening and shutting skylights; and in driving the governor of spring motors (e.g. for gramophones). If the threads of the worm cross the wheel at an acute angle, the gears are self-locking, i.e. the worm can drive the wheel but the wheel cannot drive the worm. To obtain reversibility the angle must be greater than 45° . See Gear.

Worms. Ancient city and river port of W. Germany, in the *Land* of Rhineland-Palatinate, on the left bank of the Rhine, 10 m. below Mannheim. Though severely damaged during the Second Great War when it was captured March 20, 1945, by the U.S. 4th armoured div., it retained its chief glory, the cathedral of SS. Peter and Paul, built 1000-1025, and reconstructed from 1181; this is a remarkable Romanesque building, with an altar by B. Neumann and fine Gothic sculptures. Another S. Paul's church (1016-1250), S. Andrew's (11th-13th cent.), Our Lady's (15th cent.), S. Martin's (1261), and other buildings tell of Worms's history. His famous appearance at the diet of 1521 is commemorated by a huge Luther monument. The modern town had engineering, furniture, leather, chemical, sugar, and food preserving industries, and was an important rly. junction and river port, and a co. seat. Pop. 49,000.

History goes back to the Celtic settlement Barbetomagus. From

the 5th century this was the capital of the Burgundians and about a century later the only *civitas publica* of the Frankish kingdom. A bishopric from Roman times, it received imperial privileges about 1100 and those of a free city in the 13th century. More than 100 diets were held here; that of 1521 outlawed Luther and his followers. Worms lost importance after being sacked and burned by the French in 1689; its bishopric ended in 1797, when it fell to France. It came to Hesse in 1815, and was occupied by the French 1918-30. After the surrender of Germany in the Second Great War it lay in the French zone of occupation.

Wormwood (*Artemisia absinthium*). Aromatic perennial herb of the family Compositae. A native of Europe, Asia, N. Africa, and N. America, it has grooved and angled stems, about three feet high, and silky leaves cut into many oblong segments. The drooping yellow flower-heads are in leafy sprays. See Absinthe.



Wormwood. Spray of flower-heads and leaf of the aromatic plant

Wormwood Scrubs. District of W. London, lying N. of Shepherd's Bush (q.v.) in Hammer-smith borough. It gives its name to an open space used as a recreation ground, 180 acres, and adjoining is Little Wormwood Scrubs, 22 acres. Here is a large prison.

Worsborough. Market town and urban dist. of the W. Riding of Yorks, England. Situated 3 m. S. of Barnsley on the rly., and also served by a canal, it is a coal-mining centre. Pop. 13,850.

Worship of the Dead. Widely observed religious cult. It is prominent in most early religions. The dead, whose activity is inferred from dreams, etc., are dreaded rather than loved by primitive races. To placate their ghosts, offerings are laid on their tombs, which thus become altars. See Ancestor-Worship; Animism; Apotheosis; Confucianism; Euhemerus; Hero; Mythology; Saint; Shintoism. Consult *Worship of the Dead*, J. Garnier, 1904.

Worsley. Urban district of Lancs, England, which includes the dists. of Little Hulton, Boothstown, Walkden, and Worsley. It is 7 m. N.W. of Manchester, on main rly. lines. Coal mining is the chief industry. Pop. 27,200.

Worsted. Yarn from wool which has been combed to remove the short fibres and leave the long ones laid parallel. This parallelism is retained in the subsequent spinning processes, giving a smooth, even, lustrous yarn which is almost the exact opposite of woollen yarn. The difference is due to the method of spinning rather than to use of different raw wool, but it is customary to use the merinos or "botanies" and the finer cross-breeds for worsteds, reserving the coarser wools for woollens.

Worsted is used for the best botany suitings and dress cloths, as well as finer cloths. Special types go into underwear and hosiery. Though originally called after Worstead (Norfolk), most of the world's worsted spinning has for years been carried on in the region around Bradford, Yorks. See Spinning; Wool. Consult *The Worsted Industry*, J. Dumville and S. Kershaw, 1947.

Wörth. Village of Bas-Rhin dept., France. It is in Alsace, 12 m. S.W. of Wissembourg, and is famous as the scene of a French defeat, Aug. 6, 1870, when the French lost 8,000 men; the attacking Germans perhaps somewhat more. The French call the battle Reichshofen, after another

village on the battlefield. In German occupation from 1940, Wörth was reached by the U.S. 7th army March 18, 1945. *Pron.* Vert.

Worth, CHARLES FREDERICK (1825-95). British dress designer, born at Bourne, Lincs. He was apprenticed to Swan & Edgar, London, and then served in a wholesale silk house in Paris, 1846-58. In partnership with a Swede, he set up in business as a dress-maker and ladies' tailor, and, his genius for design having attracted notice of the Empress Eugénie, rapidly achieved fortune and became the dictator of Paris fashion. He died March 10, 1895.

Worthing. Municipal borough and holiday resort of Sussex, England. Situated 61 m. S. of London, it has four rly. stations. At-



tractions include an extensive marine parade, a pier, and good bathing facilities. The buildings include a town hall, several churches, a free library and museum, etc. Ecclesiastically the oldest portion of Worthing is Broadwater, which has the fine church of S. Mary, Transitional Norman in style; in the churchyard lie the naturalists

1918; minister of Pensions, 1919; minister without portfolio, 1920; secretary for War, 1921-22 and again 1924-29; and postmaster-general, 1923-24. In 1916 he was made a baronet. He died Feb. 14, 1931.

Wotton, SIR HENRY (1568-1639). English diplomatist and poet. Educated at Winchester and at New and Queen's Colleges, Oxford, he travelled for seven years, and was in 1595 admitted a barrister at the Middle Temple. He became an agent of the earl of Essex,



Sir Henry Wotton,
English diplomatist
After C. Jansen

was knighted 1603, and acted as ambassador at Venice, 1604-12, 1616-19, and 1621-24. He was employed on missions to France, The Hague, and Vienna, on behalf of Elizabeth of Bohemia, to whom he addressed a famous poem. Wotton defined an ambassador as "an honest man sent to lie abroad for the good of his country." He became M.P. for Appleby, 1614; was provost of Eton from 1624; and M.P. for Sandwich, 1625. He died at Eton, Dec., 1639,

entered for a prize offered by a local committee. Although the prize was awarded to Henry Greathead, this inventor incorporated many features of Wouldhave's design in the vessel he eventually floated. Wouldhave died Sept. 28, 1821.

Wound (A.-S. *wund*). Injury associated with severance of the skin. Wounds are divided into three classes: punctured or stab wounds, such as those made by a dagger or bullet, in which the depth is greater than the length; incised wounds made by sharp cutting instruments, in which the length is greater than the depth; and lacerated wounds, in which there is tearing of the tissues, as in injuries by machinery, bites of animals, or shrapnel. The immediate dangers arising from wounds are fatal haemorrhage, death from interference with the functions of a vital organ, and complications (e.g. tetanus) arising from entry of bacilli or dirt into the bloodstream. (See First Aid.)

In Great Britain, unlawful wounding is punishable with five years' imprisonment. Wounding with intent to maim or to do grievous bodily harm, or to resist or prevent arrest, is punishable with life imprisonment. A wound is caused only if the skin is broken.

Woundwort (*Stachys sylvatica*). Perennial herb of the family Labiatae. A native of Europe, Siberia, and the Himalayas, it has a creeping rootstock, and branching stems about three feet high. The large, heart-shaped leaves have coarse toothed edges and are covered with soft bristles; the upper leaves are lance-shaped. When bruised, the plant gives out a strong, fetid odour. The tubular, two-lipped, dark crimson or red-purple flowers are in whorls around the upper part of the stem. See Labiatae.

Wouwerman, PHILIP (1619-68). Dutch painter. Born at Haar-



Philip Wouwerman,
Dutch painter

lem, he studied under his father and Jan Wynants (q.v.). He painted figures and animals, generally in an open-air setting, with great technical skill and industry. His rendering of



William Wouldhave,
British inventor



Worthing. The sea front, looking W., of this popular Sussex resort

Jefferies and Hudson. Fruit and flowers are grown. Further enlargement brought Goring, Durrington, and other places within the bor. The town was incorporated in 1890 and allotted an M.P. in 1945. Pop. est. 70,000.

Worthington-Evans, SIR LAMING (1868-1931). British politician. Born Aug. 23, 1868, and educated at Eastbourne College, he became a solicitor in 1890, and was M.P. for Colchester, 1910-29, and for S. George's, Westminster, 1929-31. He was parliamentary secretary to the ministry of Munitions, 1916; minister of Blockade,

and was buried in the college chapel. His works include *The State of Christendom*, publ. 1657; and letters and poems, posthumously issued as *Reliquiae Wottonianae* in 1670, the year in which Walton brought out a *Life*. Consult also *Life*, L. P. Smith, 1907. *Pron.* Wootton.

Wouldhave, WILLIAM (1751-1821). British lifeboat designer, who was a parish clerk and house painter at South Shields. After the wreck of the *Adventure* with all hands at the mouth of the Tyne in 1789, he invented an uncapsizeable lifeboat, which he

horses is especially distinguished, and he is represented in most of the European galleries. He lived and died at Haarlem.

Wozzeck. Opera by Alban Berg. The libretto, written by the composer, is based on Georg Büchner's drama of 1836, and the score, completed in 1922, is in three acts divided into 15 scenes. It represents Berg's finest achievement in formal construction, and marked a departure from close imitation of Schönberg. It was first produced at Berlin opera house, Dec. 14, 1925.

Wrangel, FRIEDRICH HEINRICH ERNST, COUNT (1784-1877). German soldier. Born at Stettin, April 13, 1784, he fought in the wars against Napoleon, held a command in Slesvig-Holstein in 1848, and was nominal commander of the Austro-Prussian forces in the war against Denmark in 1864. As governor of Berlin he put down without bloodshed the rising of 1848. Cavalry general that year and marshal from 1856, Wrangel did much to improve the condition of the Prussian army. He died Nov. 2, 1877.



Count Wrangel,
German soldier

Wrangel, KARL GUSTAV, COUNT (1613-76). Swedish soldier. Born Dec. 23, 1613, at Uppsala, the son of a prominent soldier, he served under Gustavus Adolphus in Germany as a cavalry leader when quite a youth. In 1644 he led the fleet in a successful action against the Danes at Fehmarn. In 1646 he was appointed commander-in-chief of the Swedes, coping with Turenne in Germany, and he remained at his post until the end of the war. Later Wrangel served against Poland, Denmark, and Brandenburg, and took part in affairs of state, being a regent for Charles XI from 1657. He died July 5, 1676.



Count Wrangel,
Swedish soldier

Wrangel, PETER NIKOLAEVICH, BARON (1878-1928). Russian soldier. Born in St. Petersburg, Aug. 15, 1878, and trained at the school of army engineers, he served in the Russo-Japanese War, and in the First Great War rose to general of a division. On the abdication of

the tsar, he threw in his lot with Alexeieff, and after the Bolsheviks came into power sided with Denikin (*q.v.*), succeeding that general as leader of the anti-Bolshevist forces. In 1920 he was defeated by the Bolsheviks, but not before he had effected the escape of nearly 150,000 refugees. He died in Brussels, April 25, 1928.

Wrangel Land. Island in the Arctic Ocean, off the N.E. coast of Siberia. It is situated in lat. 71° N. and long. 179° W., and is separated from the Siberian coast by Long Sound. It was discovered by an Englishman, Kellett, in 1849, and named after a Russian explorer, F. von Wrangel. The British flag was raised on the island in 1921, whereupon Canada claimed sovereignty, but renounced it three years later.

Wrangell Mts. Group of volcanic mts. in Alaska. It is situated at the great bend of the Copper river and reaches 16,140 ft. alt. in Blackburn Peak; Wrangell Peak attaining 14,005 ft.

Wrangler. One who wrangles or disputes. The term was applied at an early date in Cambridge university to those who took part in disputation (*q.v.*). Later it was given to an undergraduate taking a first class in Part I of the mathematical tripos. Until 1909 the title senior wrangler was given to the undergraduate who headed the list. Since that date the classes have been subdivided into divisions, the names in each being arranged in alphabetical order.

Wrasse. A family of fishes (Labridae), notable for their thick lips and beautiful coloration. They include numerous species, and are found about rocky shores and coral reefs. The majority feed upon molluscs and crustaceans, and are provided with powerful crushing teeth. Typical wrasses are found in the Mediterranean, but are scarce in the N. seas of Europe, only a few species occurring about the British shores. The remarkably gorgeous parrot fish of the Mediterranean belongs to the wrasse family.

Wrath, CAPE. Headland of Sutherlandshire, Scotland. It is 30 m. W.N.W. of Tongue, and forms the extreme N.W. promontory of Scotland. It is a granite rock 523 ft. in height, with a lighthouse on the summit.

Wraxall, SIR NATHANIEL WILLIAM (1751-1831). British writer. Born April 8, 1751, at Bristol, and there educated, he worked during 1769-72 for the East India Co. in Bombay and elsewhere. Returning to England after visiting

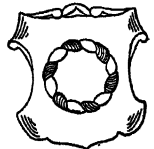
Portugal and N. Europe, he was elected to parliament, 1780, resigning in 1794. He received a baronetcy in 1813. In 1815 he was imprisoned for a libel on Count Woronzow, contained in his Mem-



Sir N. Wraxall,
British memoir writer
After J. Wright

oirs of My Own Time (1772-84). Wraxall died at Dover, Nov. 7, 1831. His works include Memoirs of the Valois Kings, 1777; History of France from Henry III to Louis XIV, 1795; and posthumous Memoirs of his own time (1784-90).

Wreath. Literally, a chaplet or garland. Early wreaths were mainly used to honour victors of various kinds, but today they are chiefly used as a sign of respect for the dead. There are several kinds of wreaths in heraldry. That placed round a helmet or under a crest represents the helmet scarf, and is shown as a twisted two-coloured band, now almost invariably a metal and a colour, either those on the shield or those of the livery. See Heraldry.

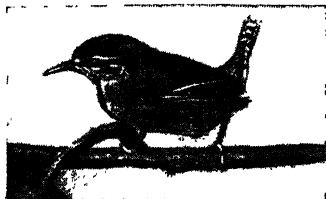


Wreath in
heraldry

Wreck. Vessel which has been stranded or so badly injured as to be helpless. In the Merchant Shipping Act, 1894, a wreck is defined as including jetsam, flotsam, and derelict found in or on the shores of the sea or any tidal water. Under the Larceny Act, 1916, it is a felony to plunder or steal any part of vessels wrecked, stranded, or cast on the shore, or any goods belonging to such vessel. In the Act of 1894 are regulations which deal with the duty of the receiver of a wreck. It prevents plunder, reports to Lloyd's in the case of any wreck exceeding £20, etc. A wreck commissioner may be appointed by the board of trade to inquire into the circumstances of a wreck. See Salvage.

Wrekin. Hill of Shropshire, England. It is 2½ m. S. of Wellington, and is made up of volcanic ashes and lavas of Uriconian age. There are remains of a camp on the summit, which is 1,335 ft. high and from which there is an extensive view. "All friends round the Wrekin" is a popular Shropshire toast. The Wrekin gives its name to a co. constituency.

Wren (*Troglodytes troglodytes*). Small insectivorous bird of the family Troglodytidae. It is a



Wren. Little song-bird, familiar in the hedgerows of Britain
W. S. Berridge, F.Z.S.

native of Europe, Asia, and N. Africa, and one of the most familiar British birds. About four inches in length (the male slightly larger), its general coloration is brown, pencilled with darker and lighter tints. Its short, cocked-up tail is a distinctive feature. The domed nest is comparatively large. See Eggs, colour plate; Farthing.

Wren. Popular name for a member of the W.R.N.S., the Women's Royal Naval Service (*q.v.*).

Wren, SIR CHRISTOPHER (1632–1723). English architect. The son of a clergyman, he was born at East Knoyle, Wilts, Oct. 20, 1632. He was educated at Westminster and went in 1649 to Wadham College, Oxford; already he had worked as an assistant to (Sir Charles) Scarborough in his experiments and demonstrations on anatomy, and acquired a sound knowledge of the subject. Wren was a fellow of All Souls in 1653, and in 1657 professor of astronomy at Gresham College, London. He was entrusted in 1660 with the task of drawing up the preamble to the charter which founded the Royal Society, and long remained one of its most active members, being president 1680–82. It was before the society that he demonstrated many experiments and inventions, including a self-registering weathercock, 1663, a new level “for taking the horizon every way in a circle,” 1666, a pair of

jointed telescopes for making astronomical measures, 1667, and a proof of the laws of motion, 1668. He remained shy and retiring, and there is reason to suppose that many of Wren's ideas were claimed by foreign scientists.

Wren's first architectural designs were for Pembroke College, Cambridge, and the Sheldonian Theatre, Oxford, begun in 1663 and 1664 respectively, both excellent in their way, but immature. In these Wren must have relied largely on his innate genius, immense knowledge of mathematics, and skill as a draughtsman. He had given up his chair at Gresham College to become Savilian professor of astronomy at Oxford, 1660, and later, at the invitation of Charles II, accepted the post of assistant surveyor-general, which he held concurrently with his Oxford appointment.

His great opportunity came when the Great Fire in 1666 laid London in ruins; in his official capacity he had presented within a week of its extinction a comprehensive plan for rebuilding the entire city. This plan, a copy of which is preserved at All Souls, reveals Wren's genius at its greatest. Had it been carried into effect, London would have become the most magnificent city in the world, and the terrible problems of haphazard building, which involved later ages in such danger and expense, would have been for the most part avoided. The plan was actually approved by the king, but its expense and an unwillingness to make big sacrifices for the sole benefit of posterity led to its being shelved.

Wren was knighted in 1672, and soon presented his second plan for S. Paul's cathedral; but after being initially approved this was rejected. To Wren it was a bitter blow, and in none of the later designs, one of which in 1675 was approved, did he approach the same level. But the work was begun at once, and by a lucky chance a clause in the royal commission empowered Wren to make what alterations he chose. To this fact is due the final design which vastly surpasses the plans from which officially it was built, and also in the opinion of authorities,

the original design on which Wren had set his heart. Work was far enough advanced by 1697 for services to be held in the choir, but not until 1716 was it finished. Meanwhile, in spite of the enormous labour on S. Paul's, Wren was engaged on his other works.

Of the 50 churches he designed the most famous are S. Mary-le-Bow, 1680; S. Nicholas Cole abbey, 1681; S. James, Piccadilly, 1683; S. Bride, 1684; S.



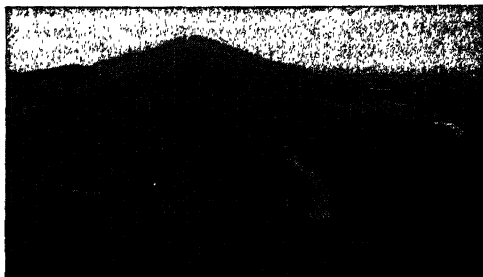
After Sir G. Kneller

Chr. Wren

Lawrence Jewry, 1686; S. Stephen Walbrook, 1687; S. Magnus the Martyr, 1687; S. Margaret Pattens, 1689; S. Margaret Lothbury, 1693. Several were bombed and destroyed in the Second Great War. He also built 36 livery companies' halls; the Monument, 1671–78; Chelsea Hospital, 1682; and the Ashmolean Museum, Oxford, 1683; as well as designing the W. towers of Westminster abbey, and the William and Mary additions to Hampton Court palace. Wren was M.P. for Plympton, 1685, and for Windsor 1688–89. He died in London Feb. 25, 1723, and was buried in S. Paul's, where is a tablet bearing the words *Si monumentum requiris, circumspice* (if you seek a memorial, look around you).

Bibliography. The chief authority is the *Parentalia* (biographies of the family) by his son, Christopher, pub. by his grandson, Stephen, 1750. Lives include those by J. Elmes, 1823; L. Phillimore, 1881; A. Stratton, 1897; L. Millman, 1908; Sir L. Weaver, 1923; C. Whitaker Wilson, 1932; G. Webb, 1937. Consult also Wren's City Churches, A. H. Mackmurdo, 1883.

Wren, PERCIVAL CHRISTOPHER (1873–1941). A British author. Having served in the British and Indian armies and also in the French foreign legion, he was for a



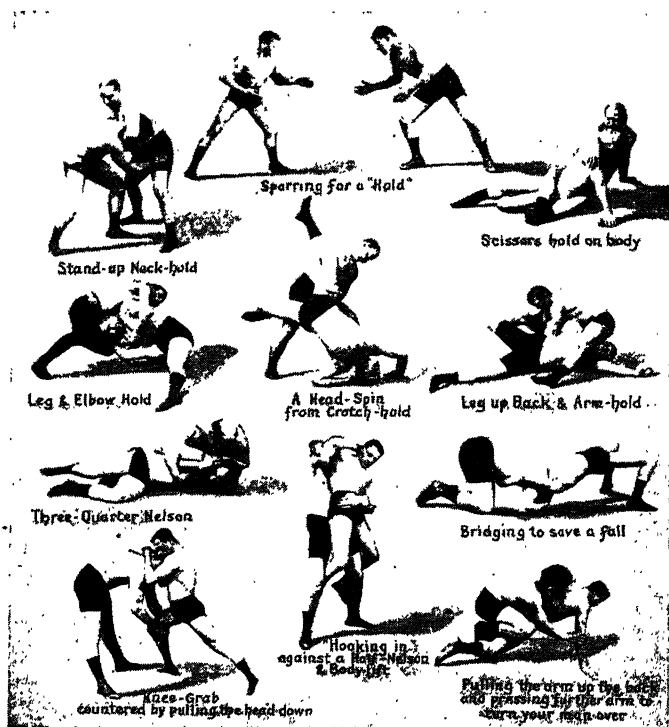
Wrekin. The Shropshire hills, probably an extinct volcano, from Ercall Hill. See facing p.
Frith

time assistant director of public education in the then Bombay presidency. He achieved immense popularity as a novelist with his dramatic and well-told stories of life in the foreign legion, such as *The Wages of Virtue*, 1916; *Beau Geste*, 1924; *Beau Sabreur*, 1926; *Flawed Blades*, 1933. *Beau Geste* was made into successful films. Wren died Nov. 22, 1941.

Wrench (A.-S. *wrenc*, cognate with wring). Name given to several kinds of spanner. (1) An adjustable spanner, in which a longitudinal screw regulates the distance between the jaws. (2) A pipe wrench, a bar with the end formed as tapered jaws, one of which is toothed to grip a pipe or round bar. (3) A pipe wrench in which two bars are hinged on a pin near one end, and toothed on their jaw edges so as to grip and turn a pipe or round bar. (4) A tap wrench, a bar enlarged at the centre with one or more holes to receive the square ends of the taps of a set of stocks and dies.

Wrench, Sir (JOHN) EVELYN (LESLEY) (b. 1882). British publicist. Born at Brookborough, Fermanagh, on Oct. 29, 1882, he was educated at Eton. He entered journalism in 1904, being attached to Northcliffe's staff until 1912, when he devoted his energies entirely to propaganda work for imperial development. The founder and organizer of the Overseas club movement, the Royal Empire society, the English-speaking Union, and the All Peoples' association, he lectured and wrote on international relations and peace, and started and edited *Over-Seas*. Sir Evelyn was also chairman of the company owning *The Spectator*, which he edited from 1925 until 1932, the year of his knighthood. His reminiscences, *Uphill*, appeared in 1934; *Struggle*, a year later; *The Immortal Years*, 1945.

Wrestling. A form of self-defence, competitive sport, and athletic exercise. There are four main styles of wrestling practised in Europe, of which the last two are largely confined to Great Britain: 1. Catch-as-catch-can (also known as Lancashire or free style); 2. Greco-Roman; 3. Cumberland and Westmorland; 4. Cornwall and Devon (also practised in Brittany). Except in the last style, for which the wrestlers wear canvas jackets used as a leverage to throw an opponent, any form of clothes that can be gripped and turned to an advantage are excluded.



Wrestling. Holds and other movements in the catch-as-catch-can style

The most widely practised of these styles is undoubtedly catch-as-catch-can, always represented at the Olympic Games. It is a skilful sport embracing rules for fair play that are as varied and clearly defined as those of boxing. In amateur catch wrestling all holds likely to cause injury or unnecessary pain are strictly barred, but tripping and struggling on the ground are permitted. Under championship conditions a contest consists of three bouts each limited to 15 minutes. To win a match the wrestler may obtain two clean falls from standing position, or pin his opponent's shoulders to the mat for one second while struggling on the ground, or win on points. Contests usually take place on a thick bristle mat about 16 ft. square and covered with tarpaulin.

The British National Wrestling Association formulates rules and regulations covering the annual championships, organizes international contests, and looks after the interests of affiliated clubs that flourish particularly in London and Manchester. Catch wrestling is also practised professionally, but the rules are somewhat freer; and holds liable to cause injury or pain are permitted,

but a wrestler may submit and lose the bout. The so-called "all-in" wrestling, or rather fighting, is often wrongly identified with professional catch wrestling.

In the Greco-Roman style all holds are taken above the waist, tripping or the offensive use of legs and feet is prohibited, and ground wrestling is encouraged. The fall is the same as in catch.

The Cumberland and Westmorland style requires taking a preliminary hold before the struggle actually begins. Each contestant passes his right arm under the other's left, and the hands are joined across the spine, giving to both an equal hold. Play then commences, and the first down is the loser. A wrestler is considered down when any part of the person other than the feet touches the ground. Tripping is an essential feature. Breaking the grip, play having commenced, is equivalent to losing the fall. This is an outdoor style of wrestling, and the same is true of the Cornwall and Devon style. In this, tripping is included; there is no ground wrestling; and both shoulders and one hip, or both hips and one shoulder, touching the ground at the same moment constitute a fall. See Jujitsu.

Wrexham. Mun. bor. and market town of Denbighshire, Wales. It stands on the Clywedog, 12 m. S.W. of Chester, and is served by rly. Always an important border town, it has grown larger with the development of the neighbouring coalfields. It is an agricultural centre, with wholesale, retail, and live-stock markets. Brewing, malting, and tanning are occupations. The bor. lies in a development area. The church of S. Giles, dating from the 15th century, has one of the finest towers in Wales. Its N. porch was restored in 1901 by graduates of Yale in honour of Elihu Yale, who was buried here. Market days, Mon. and Thurs. Pop. est. 29,200.



Wrexham arms

Wright, ROBERT ALVERSON WRIGHT, BARON (b. 1869). British judge. He was born Oct. 15, 1869, and educated at Trinity College, Cambridge. A fellow of Trinity, he was called to the bar in 1900, becoming K.C. in 1917, and a judge in 1925. In 1935 he was made a lord of appeal in ordinary, and a life peer. For two years Wright was master of the rolls, then again a lord of appeal in 1937. In 1947 he resigned, having also served as chairman of the U.N. war crimes commission. In 1939 he published a volume of Legal Essays and Addresses.

Wright, SIR ALMROTH EDWARD (1861-1947). British pathologist. He was educated at Trinity College,



Sir Almroth Wright, British pathologist

Dublin, afterwards studying at several German universities. In 1887 he was appointed demonstrator of pathology at Cambridge, and in 1889 of physiology

at Sydney, N.S.W. From 1893 to 1902 Wright was a professor of pathology at the army medical school, Netley, after which he was given the chair in experimental pathology at London university, and principal of the institute of pathology at S. Mary's Hospital. He carried out a series of important investigations on inoculation by dead cultures against typhoid, etc., and during the First Great War his methods proved of great value against wound infection.

Knighted in 1906, the same year in which he was elected F.R.S., he wrote books on inoculation and immunisation. Sir Almroth died May 1, 1947.

Wright, JOSEPH (1734-97). British painter, known as Wright of Derby. Born in Derby, Sept. 3, 1734, he studied in London under Hudson and at the R.A. schools. He painted landscapes, portraits, and clever candle-light pictures, a good example of which is *The Alchemist*. He was elected A.R.A. in 1781, but declined full honours when offered them. For some



Joseph Wright, British painter



Wrexham, Denbighshire. Parish church of S. Giles, restored in 1867

years he lived at Bath, but in 1777 returned to Derby, where he died Aug. 29, 1797. Works by him are in the National and National Portrait galleries. See illus. p. 268.

Wright, JOSEPH (1855-1930). A British philologist. Born at Bradford, Oct. 31, 1855, he became a mill-hand and did not learn to read until he was 16. After teaching in Germany, where he studied philology, he became deputy to Max Müller at Oxford, 1891, and in 1901 professor and in 1925 professor emeritus of comparative philology there. He died Feb. 27, 1930. Wright was one of the chief authorities on English philology, and at Oxford was instrumental in developing the Taylorian Institution. His *Oxford Dialect Dictionary*, 1896-1905, secured him a civil list pension in 1899; it

was followed by a series of historical grammars of Old German, Old English, comparative Greek, and Gothic. Consult J. W., Man and Scholar, E. M. Wright, 1932.

Wright, WHITAKER (1845-1904). British financier. He was born Feb. 9, 1845. After some years of successful speculation, he was sentenced in London, Jan.

26, 1904, to seven years' penal servitude, for frauds on the shareholders and creditors of the London and Globe Finance Corporation by the issue of fraudulent balance sheets. The company collapsed in 1901, and two other Whitaker Wright ventures failing and causing widespread disaster, there was a demand for his prosecution, which was for long abortive. The total deficit was £5,500,000. Wright fled to the U.S.A., and was not extradited until 1903. He committed suicide on the day sentence was passed.

Wright, WILLIAM ALDIS (1836-1914). British scholar. Educated at Trinity College, Cambridge, he was secretary to the O.T. revision committee, 1870-85, vice-master of Trinity, Cambridge, 1888-1912, and joint editor of *The Journal of Philology*. He was editor, with W. G. Clerk, of *The Cambridge Shakespeare*, 1863-66, 2nd ed. 1891-93; and the *Globe Shakespeare*, 1864. In addition to Bacon's Essays, Milton's Poems, and Roger Ascham's English writings, he edited the Works of Edward FitzGerald, 7 vols., 1903. He died May 19, 1914.

Wright Brothers. Two American pioneers of flying. The elder, Wilbur Wright (1867-1912), was born at Millville, Ind., on April 16, 1867, the younger, Orville (1871-1948), at Dayton, Ohio, on Aug. 19, 1871. The pioneers of flight in power-driven machines, they began by experimenting with gliders, at Kitty Hawk, N.C.



The Wright brothers, flying pioneers: left, Orville; right, Wilbur

By 1903 they had virtually solved the problems of aeroplane control. To the glider they added a petrol engine, and on Dec. 17, 1903, they made four flights, the longest of 852 ft., which entailed being in the air for nearly a minute. That was the first occasion on which a man had been carried from the ground in an aeroplane.

In 1905 Wilbur covered 24 m. in 38 mins. The brothers went in 1908 to France and there demonstrated their conquest of the air. At Dayton, Ohio, they set up an aircraft-making business, which had become highly successful, though involved in much litigation with rival claimants, by the time Wilbur died of typhoid fever on May 30, 1912. Orville continued to manage the concern and lived until Jan. 30, 1948. Consult The Wright Brothers, F. C. Kelly, 1944.

Wrightia tinctoria OR PALA INDIGO. Small tree of the family Apocynaceae. Growing native in



Wrightia tinctoria. Leaves, flower clusters, and long, slender pods

the Indian sub-continent, it has large oval leaves of variable breadth and clusters of white flowers. From the leaves an inferior kind of indigo is prepared. The wood is close-grained and much like ivory, which makes it suitable for toys, turning, and inlaying.

Wrighton. Village of Somerset, England, 6 m. N.N.E. of Axbridge. It has a rly. service. It is famous for its church, the tower of which is perhaps the finest in Somerset, and as the birthplace of Locke. Pop. 1,369.

Wrinkles. Lines and creases in the skin produced by the action of the underlying muscles. The constant repetition of particular muscular actions leads eventually to wrinkles becoming permanent. Some lines in the forehead are recognized by psychologists as reflecting tension in brain areas.

Wrist OR CARPUS. In man, the joint and structures which separate the bones of the arm from those of the hand. It is composed of eight bones arranged in two rows, namely, the scaphoid, lunar, pyramidal, pisiform, trapezium, trapezoid, os magnum, and unciform. At the upper margin the bones present smooth cartilaginous surfaces for articulation with the radius and ulna of the forearm. At the lower margin are surfaces for articulation with the metacarpal bones of the palm. See *Dropped Wrist*.

Writ. Literally, something written. The word is now used exclusively for orders issued by the courts of law. In the U.K. almost all legal proceedings begin with the serving of a writ by the plaintiff upon the defendant. Writs are issued after certain formalities have been complied with and fees paid, and state what the plaintiff demands. Writs must be served, i.e. handed to, the defendant in person, unless he agrees to accept service through a solicitor, although the courts can order a substituted service. The term is also used in connexion with parliamentary elections, as these take place on receipt of a writ addressed to the returning officer. Formerly new peers were created by writ, and the word is also used in connexion with convocation. See *Habeas Corpus*.

Writer's Cramp. Spasmodic contraction of some of the muscles of the fingers and hand, associated with neuralgic pains, which comes on whenever the sufferer attempts to write. The spasm does not occur when the hand is used for other actions, and is due to fatigue of the brain centres governing the particular movements involved in writing. Psychologists consider that this type of spasm has some connexion with experiences in youth. A similar spasm may occur in weavers, cigarette rollers, and telegraph operators, owing to the excessive use of a particular group of muscles. Prolonged rest is essential, and massage is helpful.

Writing. Art of communicating ideas, on some more or less durable surface, by means of signs intelligible to the eye, with a view to their transmission to others or their preservation to future generations. The two main stages in the development of writing, which

ORATIONI O VERO ME
dintioni dalle yuuu la mente
e mcluta a patientemente pa
ure ogni afflitione et sprezzare
la vana prosperita di questo mo
do et sempre desiderare leterna
beatitude. raccolte da alcune
fante opere per la valorosima
et humanissima principessa. Cath
rina regina d'inghilterra francia
et hibernia Tradoue per la signo
ra Elizabetha dalla lingua inglese
in vulgare italiano

Writing. Page of prayers in the handwriting of Queen Elizabeth, c. 1545 (reduced to quarter size)

Latin & Greek 45-65 Cent.	Anglo-Saxon 105 Cent.	Italian 1575 Cent.	Modern Print	Modern 1870-90	Copy Books Present Day
B	B	B	B	B	B B
R	R	R	R	R	R R
F	F	F	F	F	F F
H	H	H	H	H	H H
V	V	V	V	V	V V
Y	Y	Y	Y	Y	Y Y

Writing. Example of capitals of six periods, 4th-20th centuries (reduced to quarter size)

The Green Valley had long
been called the Black Valley,
when those who laboured
grew rich in it awoke - as
man must wake sooner or
later - to the needs of the
spirit above the flesh.

However, Ernie was quite to
be trusted. He was a steady
little fellow, and well liked by

Writing. Scripts taught in the 20th century, founded on the distinctive lettering of the 16th century (reduced to quarter size)

By courtesy of Sir Isaac Pitman & Sons

at times overlap, are ideography, the representation of objects or ideas by means of pictures; and phonography, the representation of sounds by written symbols.

The earliest method of writing was pictography, picture-writing. Gesture-language, including the deaf and dumb system, of communication, has also been described as a kind of writing.

The Latin system of writing, the cursive style of which is the parent of most of the European systems,

originally did not distinguish the forms of the letters for use in MSS. and inscriptions. Both were what is known as capital, in which each letter had a separate outline, as contrasted with cursive (running hand), in which the separate strokes were joined. By rounding off the letters and altering their original proportions capitals became uncials; a later development was the semi-uncial, in which, under the influence of cursive, majuscule (large letters) more and more gave way to minuscule (small letters). In early times the Romans had a cursive system, which was used in copies of imperial rescripts and may be seen in the *graffiti* or mural inscriptions of Pompeii. This cursive gradually spread from Italy over the West and was the origin of the national systems of writing.

Irish and Carolingian

The origin of the Irish script is obscure; it was probably brought to Ireland by missionaries from Gaul. It exercised great influence on European writing through the foundation of monasteries in Germany, Switzerland, Gaul, and Italy. Anglo-Saxon, derived partly from Irish and partly from Roman script, is of special importance as the parent of the Carolingian (Caroline) minuscule, the source of the modern alphabet. In the 9th century Charlemagne decided to reform the existing system of writing. The result was the formation of the Caroline minuscule, a compound of all kinds of script—capital, uncial, and minuscule—and this was at its best towards the end of the 11th century.

It gradually deteriorated, however, and by the 14th century had developed into Gothic or Black Letter, in which the rounded parts of the Caroline minuscule were angularised. This is the origin of the modern German printing script. In Italy, however, there was a renaissance of the Caroline style in the form of an elegant script, which through the medium of the great printers, such as Aldus, became the basis of the modern types of writing.

The invention of printing had obviously a great influence on writing, but it was some time before this was felt, and the beautiful penmanship of the medieval scripts persisted into the 17th century. Gradually, however, writing deteriorated. Reasons were the introduction in 1820 of the steel pen, which made writing worse because the older models were unsuited for this kind of pen, and the increase in speed demanded by modern

conditions, which made continuous pen movement, often attended with illegibility, more general. In the 20th century there arose a movement for a return to forms of writing in use in Tudor times. Apart from any question of its greater beauty, the "script" method, as taught in many schools, in which each letter is written separately, has the advantage that the same symbol is used for writing as for printing, thus making the task of the child lighter. Meanwhile there has been a revival of old-style scripts as an art form, for which both quill and reed pens are used. This "art" revival has proved popular enough to have been reflected commercially in show cards, etc. The standard British work on the history and practice of writing is Edward Johnston's *Writing, Illuminating, and Lettering*, first published in 1906 and many times reprinted. See Alphabet; Cuneiform; Ink; Lettering; Manuscript; Palaeography; Paper; Papyrus; Pen.

Wroclaw. Polish name for the city of Silesia called in German Breslau (*q.v.*).

Wrotham. Urban district of Kent, England. It is 6 m. N.E. of Sevenoaks and on the main London-Canterbury road; it is served by Green Line, and has a rly. station, Wrotham and Borough Green. The church of S. George, an Early English building, has some old brasses and a screen of the 14th century. Here until about 1350 the archbishops of Canterbury had a palace. Pop. 4,516. *Pron.* Rootam.

Wrought Iron. One of the purest forms of iron available commercially. Some of the Swedish and Russian irons have a purity of 99.75 p.c., containing less than 0.2 p.c. of carbon with minute traces of other impurities. Wrought iron does not harden like steel by being quenched in water while hot; it is easily magnetised, but does not retain the magnetism. It appears on the market in the forms of billets, bars, angles, tees, plates, sheets, rods, rails, joists, and channels. The tensile strength of wrought iron ranges from 17 to 27 tons per sq. in. See Iron; Metalurgy; Steel.

Wroxeter. Village and parish of Shropshire, England. It is situated on the Severn, 6 m. S.E. of Shrewsbury. The Roman Uriconium, capital of Britannia Secunda, it contains interesting remains, including part of the public baths and a wall of the basilica. The

church of S. Andrew has a Saxon nave. See Uriconium.

Wroxton Abbey. Former seat of Lord North, near Banbury, Oxon, England. Built 1618 by Sir William Pope, 1st earl of Downe, and notable for its fine hall, chapel, library, portraits, and Stuart relics, it passed to the North family by the marriage of Francis North, 1st Baron Guilford, and Lady Frances Pope, sister of the 4th and last earl of Downe. It occupies the site of a priory of Augustinian canons founded by Michael Belet in the reign of John and dissolved in 1534.

Wryneck (*Jynx*). Small British bird, related to the woodpeckers. Its name is due to the habit of



Wryneck. Bird which feeds largely on ants

twisting its neck as it picks up ants. The general colour of the upper parts is grey, spotted and barred with brown, while the under parts are dull white with brown markings. The

bird is fairly common in the S. of England, rare in the N. and in Scotland, and absent from Ireland.

Wuchang. Capital of Hupeh prov., China. It is on the right bank of the Yang-tse river, opposite Hankow and Hanyang, which together with Wuchang form the "three cities," the chief trade centre and most important industrial area of central China, with a total pop. of about 1,250,000. Wuchang has cotton and ore-crushing mills. During the Japanese advance on Hankow in 1938 Wuchang was severely bombed on July 12, more than a hundred being killed. The Japanese entered Hankow, Oct. 25, after the Chinese had withdrawn, and occupied Wuchang next day, no attempt being made by the Chinese to hold it. The loss of the "three cities," which remained in possession of the invaders until Japan's surrender in 1945, deprived the Chinese forces of their principal internal source of war supplies. From Sept., 1943, Wuchang was subjected to periodical attack by U.S. aircraft.

Wu-chow. Former treaty port of China, at the junction of the Cassia river with the Si-kiang or West river, Kwangsi prov. It was opened to foreign trade in 1897. During summer floods, the river may rise 50 ft. Pop. 58,106.

Wuhu. River port in Anhwei prov., China. It stands on the right bank of the Yang-tse river, 256 m. W. of Shanghai. It was opened to foreign trade in 1877. Rice and cotton are exported, while the neighbourhood is interested in coal and silk.

On Dec. 5, 1937, Japanese aircraft dropped six bombs on two British craft at Wuhu, the Tuck-wo 3,700 tons, and the Tatung, 1,560 tons, the first being burned to the waterline, the second holed so that she had to be beached. Forty-two Chinese were killed, 100 injured, and bomb splinters hit the British river gunboat Ladybird, her commander, Lieut.-Cmdr. Barlow, being slightly injured. This attack on the Ladybird was among the crimes for which Col. Hashimoto was condemned to life imprisonment in 1948 (see Tokyo Trials). The Japanese captured Wuhu a day or two later, and from it attacked by warship up river towards Hankow. They held Wuhu until their general surrender in 1945.

Wukari OR OKARI. Town in the Benue prov., Nigeria. Situated 28 m. S. of the Benue river, between its Katsena and Donga affluents, it was the capital of the former native Kororofa kingdom, founded more than three cents. ago by Hamites from the Sudan.

Wulfenite. Minor ore mineral of molybdenum, lead molybdate, PbMoO_4 . It is found as yellow to orange tabular crystals in the oxidised parts of ores containing galena (lead sulphide) and molybdenite (molybdenum sulphide).

Wulfhere (d. 675). King of Mercia. The youngest son of the heathen King Penda, he nominally succeeded to the crown in 655 and was the first Mercian ruler to be baptized. He expelled the Northumbrians in 659, and augmented his realm at the expense of Wessex, exercising sway as far as Sussex and possibly Kent. His chief victory occurred in 661 at Posentebryg (perhaps Pontesbury, Salop). Wulfhere appreciated the political value of a stable Church, and encouraged missionaries.

Wulfstan OR WULSTAN (c.1012-95). English saint and prelate. Born at Long Itchington, near Warwick, he was educated at Evesham and Peterborough. Entering the monastery at Worcester, he became prior, and in 1062 was consecrated the last Anglo-Saxon bishop. He died Jan. 18, 1095. He was canonised in 1203 and his feast day is Jan. 19. Another Wulfstan (d. 1023) became archbishop of

York in 1003. A remarkable homily in alliterative prose (ed. A. Napier, 1883), vividly describing the state of England in 1014, has been attributed to him; his writings probably influenced Canute.

Wullenweber, JÜRGEN (c.1492-1537). Hanseatic statesman. Born of a Hamburg family, he was made a burgher of Lübeck in 1530, and as burgomaster in 1533 conceived the idea of reviving the Hansa power by subjugating the commercial cities of the Netherlands and Denmark. His policy met with great opposition, and, seized while passing through the territory of the archbishop of Bremen in 1535, he was imprisoned at Wolfenbüttel. Under torture he made admissions, which as soon as he was released from the rack he declared to be false, of peculation and of Anabaptist tendencies. He was executed, Sept. 24, 1537, and became the hero of Lübeck.

Wundt, WILHELM MAX (1832-1920). German psychologist. Born at Neckarau, Baden, Aug. 16, 1832, he studied medicine at Tübingen, Heidelberg, and Berlin. He became a lecturer and professor at Heidelberg. In 1874 Wundt transferred to Zürich as professor of philosophy, and in 1875 to Leipzig, where in 1879 he founded the first laboratory for experimental psychology. Wundt regarded philosophy as universal science, which performs the synthesis of particular sciences. Psychology, according to him, is "the science of immediate experience." His great merit is that he applied the inductive method to the purely philosophical sciences (logic, ethics), and used physiology as the basis of psychology, but not an end in itself. In ethics he was an evolutionist. He died at Leipzig, Aug. 31, 1920. Among his chief works, with dates of Eng. trans., are: *Ethics*, 1897-1901; *Human and Animal Psychology*, 1901; *Principles of Psychological Psychology*, 1904; *Logic*, 1906; *Outlines of Psychology*, 1907; *Introduction to Psychology*, 1912; *Introduction to Philosophy*, 1914; *Elements of Folk Psychology*, 1916. *Pron.* Voont.

Wu Pei-Fu (1873-1939). Chinese soldier. A native of Shantung, he entered the civil service, then in 1898 the army. In 1917 he fought against monarchist forces,

overthrowing the Anfu government, and came to the front in 1920 as governor and inspector-general of Hupeh and Hunan. Always hostile to Japanese influence, in 1922 he assailed and defeated Chang Tso-Lin, pro-Japanese governor of Manchuria, and was hailed as the saviour of China. Another campaign against Chang in 1924 led to the betrayal of Wu by his former colleague, the general Feng. He fled to Japan, but next year forced Feng to evacuate Peiping. Wu was defeated in 1926 by invaders from Canton, and went into retirement in Szechwan, dying Dec. 4, 1939.

Wuppertal. Industrial town of Germany. It lies in the Ruhr basin, 18 m. E. of Düsseldorf, and was formed by the union in 1929 of the twin towns of Elberfeld and Barmen, and the suburbs of Cronenberg, Ronsdorf, and Vohwinkel. Wuppertal (Wupper valley) is situated in the narrow valley of the river Wupper and owes its rapid growth to its textile industry; before the Second Great War, it made linens, carpets, rayon, clothing, etc., and had also ironware, machinery, tool, chemical, wallpaper, and other factories. An important rly. centre, it had a striking feature in an overhead hanging electric railway, the *Schwebelbahn*, constructed above the river so as to relieve traffic in the narrow streets of Elberfeld, which dates from the 13th century, and became a municipality in 1610. Barmen, founded in the 11th century, was made a town in 1808. Industrialisation began in the 18th century.

Wuppertal suffered under the Allied bombardment from the air of the Ruhr area during the Second Great War; it was captured by the U.S. 9th army April 15, 1945, and after Germany's surrender lay in the British zone of occupation. Pop. 352,500.

Wurm See. Lake of Bavaria, Germany. Also known as the Lake of Starnberg, it is 18 m. S.W. of Munich in a residential dist. It is 1,920 ft. above sea level, and is 370 ft. deep, $12\frac{1}{2}$ m. long, and from $1\frac{1}{2}$ to 3 m. wide. Steamers connect the pleasure resorts on the lake. Herein Louis II, king of Bavaria, was drowned, June 13, 1886.

Württemberg. Former German free state, until 1918 a kingdom, third in size, fourth in pop., of the second German empire. It was 7,534 sq. m. in area, with a pop. (1940) of 2,696,324. Its capital was Stuttgart (q.v.); there were no other towns of more than 100,000. Tübingen has a famous university.



W. M. Wundt,
German philosopher

The greater part of Württemberg, combined with N. Baden, was in 1946 formed into the *Land* of Württemberg-Baden (area 6,033 sq. m.; pop. 3,650,000). The S. portion, with some former Prussian territory, became the *Land* of Württemberg-Hohenzollern (area 3,886 sq. m.; pop. 1,115,000).

With spurs of the Alps and Black Forest in the S. and S.W., and the Swabian Alps in the S.E., Württemberg is fertile, 62 p.c. of the soil being under cultivation. The chief river is the Neckar, but the Danube, navigable from just inside Württemberg's borders, rises in that country; there are many smaller rivers, and the N.W. part of the lake of Constance lies within it. It has many salt deposits and mineral springs, feeding spas, e.g. Wildbad and Teinach. Forestry is important and timber industries of every kind flourish, with paper, textile, car, furniture, leather and shoe, clock and musical instrument making, also engineering.

The pop. belongs chiefly to the Swabian tribe, but has absorbed Roman, Frankish, Huguenot, and other elements. It has long been reported intelligent, hard working, and progressive, and constitutes the oldest and one of the most liberal and democratic of German communities. It is 67 p.c. Protestant, 31 p.c. R.C.

A county within the Frankish kingdom, and partly within the Swabian duchy in the days of Charlemagne, Württemberg proper originated with a dynastic family of that name, first mentioned 1090 A.D. Counts Eberhard II and III, in the 14th and 15th centuries, fighting against knights and free cities, won large territories; Eberhard V was made a sovereign duke 1495; Ulrich (1503-50), after losing his lands for a time to the Hapsburgs, introduced the reformed religion. Homeland of the imperial dynasties of Hohenstaufen and Hohenzollern, Württemberg was involved in the Peasants' and Thirty Years' Wars and the War of the Spanish Succession, was conquered by French armies of the republic and of Napoleon, raised by him to the rank of kingdom in 1805, in arms against him—after fighting Prussians and Austrians on his side—from 1813. It stood with Austria against Prussia in 1866 and joined Prussia in 1870 only. Its last king, William II, abdicated Nov. 30, 1918; as a republic it had Socialist, Liberal, and Conservative premiers, until it came under a Nazi Reich Statthalter, Murr.

Overrun by the French 1st and U.S. 7th armies during the Second Great War, its N. part lay within the U.S., its S. part within the French, zone of occupation.

Wurtzite. Rare mineral form of zinc sulphide. It differs from the common ore mineral, sphalerite (*q.v.*), which has the same composition, in atomic structure and crystal symmetry.

Würzburg. German university town. Capital of the Bavarian dist. of Lower Franconia, and fourth largest town in Bavaria, it lies in a hilly and rocky area, on the river Main, navigable from here, and 55 m. N.W. of Nuremberg, being an important rly. junction. Its architectural and other treasures included the Romanesque church of S. Burkhard (1033-42), the cathedral of S. Kilian (partly 11th century), the Neumünster church (1000-1056) with famous busts of the town's patrons by Tilman Riemenschneider, S. Mary's chapel (1377-1479) with fine tombs, the Stift-Hauger church with two towers of 280 ft. (1670-91); the castle of Marienberg, first mentioned in 704 and later the residence of the prince-bishops of Würzburg, which became the seat of a bishop in 741; the town palace, former seat of the Teutonic knights (1600), the new palace (1720-44), famous for its staircase and Tiepolo frescoes; the old university (1582-92); beautiful parks, terraces, monuments; the Julius hospital (1576-85); and three bridges, the oldest, 645 ft. long with 12 baroque statues, dating from 1543.

In a very fertile dist. producing a famous wine and much fruit and vegetables, it had also some important industries: the making of printing presses, furniture, and leather, engineering, iron founding, and printing. It had a university, 1402-34, refounded 1582, with a library of ~550,000 vols., many museums, colleges, hospitals, monasteries, and two permanent theatres. Pop. 64,350.

Würzburg was very badly damaged during the Second Great War. The R.A.F. bombed it heavily at night on March 16, 1945, starting many fires: the U.S. 7th army reached Marienberg, on the Main, on April 3, forced a passage of the river, and after fierce street fighting succeeded in overcoming German resistance on April 6. Würzburg came into the U.S. zone of occupation.

Wurzen. Town of Saxony, E. Germany, on the Mulde, 12 m. E. of Leipzig. Before the Second

Great War it enjoyed an international reputation for its carpets and tapestries; it also had biscuit, engineering, and paper works. One of the oldest German settlements E. of the Elbe, known in 961 as a stronghold and castle, it has a famous Romanesque cathedral (1114), a bishop's palace of the 15th century when Wurzen was a bishopric, and S. Wenceslas's church (1673). In 1581 it fell, together with the secularised Meissen patrimony, to Saxony. Captured by the U.S. 9th armoured div. on April 16, 1945, after Germany's surrender it lay in the Russian zone of occupation. Pop. 22,200.

Wusung. Town at the mouth of the Hwangpu river in Kiangsu prov., China. It is connected by rly. with Shanghai, 10 m. to the S., which it serves as a port.

Wuthering Heights. Only novel by Emily Brontë; published in 1847 over the pseudonym of Ellis Bell. At first severely criticised for its morbidity and violence, the story is now regarded by some critics as the finest of the prose writings of the Brontës. It stands by itself as a work of sheer imaginative power. The characters, dominated by Heathcliff, embodiment of fierce elemental passion, are well attuned to the harsh, bleak, tempestuous setting of the Yorkshire moors.

Wyalong. Town of Australia, in Bland co., N.S.W. A centre for gold mining, it is on the branch rly. to Cargelligo, and lies 342 m. W. of Sydney.

Wyandot. N. American Indian tribe of Iroquoian stock. A confederacy of four tribes, called by the French colonists Huron, and numbering about 10,000, occupied a region S. and E. of Georgian Bay, Ont., when dispersed by Champlain in 1615. After the Iroquois exterminated the Huron settlements in 1648 there arose a new tribal grouping. Called by the English Wyandot, from the native name Wednat, these people acquired paramount influence in the Ohio valley and the lake region, where they supported the British arms. In 1921 the Ontario government published MSS., written 1740-51, comprising contemporary records and a Huron (*q.v.*) grammar.

Wyandotte. Breed of domestic fowls. It originated in the U.S.A.—Wyandotte is the name of a place in Michigan—about 1872, when the birds were mentioned as American Sebrights. They are descended from Brahmas crossed probably with Polish. In shape

they resemble the Brahma, but are rounder and fuller-breasted. They have yellow legs and glossy black tails, fuller than in the Brahma. The ground colour of the plumage is white, with every feather evenly laced with black. They are hardy birds, good layers, and good sitters. See Fowl-colour plate.

Wyandotte Cave. Natural cave in Crawford co., Indiana, U.S.A. Situated about 5 m. N.E. of Leavenworth, it measures 23 m. in length and consists of a succession of galleries and divisions. The most extensive chamber, the mammoth hall, is 350 ft. long and 250 ft. high.

Wyatt, JAMES (1746-1813). An English architect, born at Burton Constable, Staffs, Aug. 3, 1746. He became an A.R.A. in 1770, and made his name by adapting and rebuilding the old Pantheon in Oxford Street, London, 1772. His chief work was done in restoration at the cathedrals of Salisbury, Hereford, Lichfield, and others, and at Windsor Castle. His action in demolishing medieval buildings of great beauty earned Wyatt the nickname of The Destroyer, but he was to some extent responsible for the Gothic revival in England. Fonthill Abbey was perhaps his best original work. He became R.A. in 1785, and died Sept. 5, 1813. His son, Matthew Cotes Wyatt (1777-1862), was a well-known sculptor, executing the equestrian statue of George III in Pall Mall. A study of the father, by A. Dale, came out in 1936.

Wyatt, ROBERT ELLIOTT STOREY (b. 1901). English cricketer. He was born May 2, 1901, at Milford, Surrey, and went to school at Esher and Coventry; so Warwickshire was the county of his adoption, and he first played for it in 1923, becoming captain 7 years later. A solid batsman, he exceeded 1,000 runs in each of 14 seasons before the Second Great War; 1937 brought 2,625 runs with nine centuries, both records for the county, and his highest innings of 232. He was a useful bowler with the new ball. Making his international début in 1929 against New Zealand, he was England's captain for the last test against Australia in 1930, and the 1934 series. From 1946 he played occasionally for Worcestershire.

Wyatt or WYAT, SIR THOMAS (c. 1503-42). English courtier, diplomatist, and poet. Son of Sir Henry Wyatt (d. 1537), he was born at Allington Castle, Kent, and educated at S. John's College, Cambridge. He enjoyed the favour

of Henry VIII, and was ambassador to Charles V, 1537-39. His too intimate relations with Anne Boleyn, and his friendship with Thomas Cromwell, led to his imprisonment in the Tower, 1536 and 1541. He was knighted in 1537, and was M.P. for Kent in 1542, but died at Sherborne on Oct. 11 the same year.

Wyatt, with Surrey, introduced the sonnet into England. Deeply read in foreign literature, he took the Italians, especially Petrarch, for his model. His satires, lyrics, and ballads show much thought if little melody. His verse was published only posthumously, in Tottel's Miscellany of 1557; his works were edited by G. F. Nott, 2 vols., 1815-16, and by E. Arber, 1870. Consult also Sir Thomas Wyatt and Some Collected Studies, E. K. Chambers, 1934.

Wyatt, SIR THOMAS (d. 1554). English conspirator. Son of the above Wyatt, the poet, he fought on the Continent from 1543. In 1554 he became a leading spirit in the plot to prevent Mary I's marriage with Philip of Spain. On Jan. 26 he raised his standard at Rochester and called on the county of Kent to depose the queen and crown Elizabeth. Popular hatred of the marriage brought Wyatt a considerable following, and he advanced on London, entering Southwark, Feb. 3. London Bridge was closed against him, but Wyatt made his way round by Kingston. His army was beaten and he was captured and beheaded, April 11.

Wycherley, WILLIAM (c. 1640-1716). English dramatist. He was born at Clive, Shropshire, and was educated in France and at Queen's College, Oxford, then was entered at the Inner Temple. His first play, *Love in a Wood*, or S.



Sir Thomas Wyatt,
English sonneteer
After Holbein



Sir Thomas Wyatt,
English conspirator



William Wycherley,
English dramatist
After Sir P. Lely

James's Park, produced 1671, established his reputation at once. He became *persona grata* at the court of Charles II, and within a year was the lover of the duchess of Cleveland, the king's mistress. According to the custom among gentlemen at that period, Wycherley then passed a short time in the navy. His second play, *The Gentleman Dancing Master*, printed 1673, was a failure; but his later works, *The Country Wife*, printed 1675, and *The Plain Dealer*, printed 1677, set the seal on his fame and served as a foundation for the great age of Restoration comedy in which Congreve, an avowed imitator of Wycherley, was chief luminary.

In 1679 Wycherley, attracted solely by her fortune, secretly married the dowager countess of Drogheda. She died two years later, and after contesting a lengthy lawsuit he was imprisoned for debt. James II released him, paying off his creditor, and Wycherley thereafter lived in retirement until his death, Jan. 1, 1716. His last years were embittered by the action of Pope, whom he had befriended and who had corrected and rewritten Wycherley's feeble verses, but who eventually poked much malicious fun at him in his old age. Wycherley was buried in S. Paul's, Covent Garden.

Wycherley's comedies are brilliant representations of the society of his time. Their plots are immoral, and their dialogue coarse; but the characters remain essentially true to life irrespective of their period. The plays enjoyed great popularity both in their own day and later, and their influence on the development of English comedy was incalculable. Consult *Brawny Wycherley*, W. Connely, 1930.

Wychwood. District of Oxfordshire, England, formerly a royal forest. In the W. of the co., between the rivers Windrush and Evenlode, it was made a royal hunting ground about 1200. It was disafforested in 1862, but there are scattered remains of it in the form of woods. Shipton-under-Wychwood is an attractive village. As Witch Wood the name supplied a title for one of John Buchan's novels.

Wycliffe, JOHN (c. 1325-84). English reformer. A native of Hipswell, near Richmond, Yorks, he went to Balliol College, Oxford, of which college he was master c. 1360, and achieved a high reputation as scholar and preacher. Thence he withdrew, perhaps

ejected in 1367 when secular clergy were superseded by monks, and took up the work of a parish priest at Fillingham, Ludgershall, and in 1374 at Lutterworth. As a zealous reformer of clerical abuses, and an able controversialist, he was called in by the political anti-clerical party headed by John of Gaunt.

Hitherto he had appeared only as an enemy of clerical vices and pretensions, and an advocate of the apostolic life of the clergy, who should not, he held, own property. The pope in 1377 issued five bills against Wycliffe's doctrines. But in 1378 he began his translation of the Scriptures



John Wycliffe, English reformer
From a print by G. White

into the vernacular, a rendering which was the basis of all later translations and may be accounted the first English prose classic. He also initiated the principle, later one of the foundations of the Reformation, of making the words of Scripture the criterion of Christian doctrine. He disseminated his teaching by pamphlets in English, and by the organization of a sort of missionary association of preachers. Hence it was a short step to an attack on the sacerdotal theory of religion, and by 1380 Wycliffe was questioning transubstantiation. This was too much for Oxford, for Gaunt and the anti-clericals, who disowned the reformer.

But such teaching could be easily adapted to their own ends, not only by anti-clericals but also by communistic social reformers, who played their part in the peasant rising of 1381; the Lollards, as Wycliffe's followers came to be called, were soon regarded rather as political anarchists than as reformers of clerical abuses. The archbishop of Canterbury condemned Wycliffe, who, however, escaped per-

secution and lived to produce his *Trilogus* and *Opus Evangelicum*. He died on the last day of 1384. This man of great intellect, fearlessness, and honesty had a most important influence abroad, especially in Bohemia, through his great disciple Hus. In England his work appeared to fail immediately in the persecution of the Lollards, yet he may be seen as the forerunner of the Reformation. See Bible; Hus; Lollards.

Bibliography. Select English Works, ed. T. Arnold, 1869-71; W. and the Lollards, G. C. Carrick, 1898; England in the Age of Wycliffe, G. M. Trevelyan, 1904; J. W., a Study of the English Church, H. B. Workman, 1926.

Wye. River of Wales and England. It rises on Plynlimon, in Montgomeryshire, and flows mainly S.E. into the estuary of the Severn just below Chepstow. Its length is 130 m. It passes through Radnorshire and Herefordshire, and for parts of its course forms the boundary between Wales and England, and between Monmouthshire and Gloucestershire. On its banks are Rhayader, Builth, Hay, Hereford, Ross, Monmouth, and Chepstow. Its tributaries include the Elan, Ithon, Lugg, and Monnow. The Wye valley is noted for its beautiful scenery. (See Chepstow; Hereford; Symond's Yat.) There is also a Wye in Derbyshire, a tributary of the Derwent; and one in Bucks, a tributary of the Thames.

Wye. Village of Kent, England. It is 4 m. N.E. of Ashford and has a rly. station. Here is the South-Eastern Agricultural College,

the founder William of Wykeham (*q.v.*). Pron. Wiccām-ist.

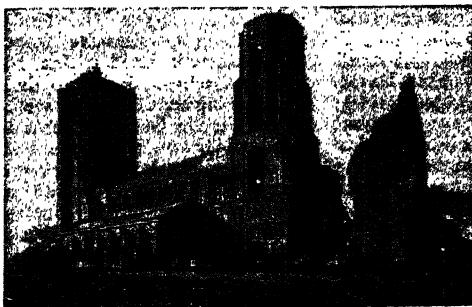
Wylam. Village of Northumberland, England. It is on the rly. from Carlisle to Newcastle, 8½ m. W. by S. of the latter, and is immediately S. of the Roman Wall. George Stephenson was born here.

Wyld, HENRY CECIL KENNEDY (1870-1945). British philologist. Born March 27, 1870, he went to Charterhouse and later studied abroad before entering Corpus Christi College, Oxford. From 1899 he lectured in the English language at Liverpool, becoming professor of English language and philology there in 1904. In 1920 he returned to Oxford as Merton professor of English language and literature, occupying this post until his death, Jan. 26, 1945. Wyld wrote much on philological subjects, his *History of Modern Colloquial English* (1920) being termed epoch-making. His *Universal Dictionary of the English Language* (1932) was also notable.

Wyllie, WILLIAM LIONEL (1851-1931). British painter, born in London. He first attracted attention with a marine composition, *After a Storm*, 1869, and from that time devoted himself to sea and historical pieces. He excelled in drawing craft of all kinds, and became one of the best-known marine painters of his day. His canvas, *The Thames Below London Bridge*, was bought by the Chantrey bequest for the Tate. Wyllie was elected A.R.A. in 1889, R.A. in 1907. His publications included a study of Turner, and *Sea Fights of the Great War* (with M. F. Wren). Wyllie died April 6, 1931.

Wymondham.

Market town of Norfolk, England. It stands on the rly. 10 m. S.W. of Norwich. The chief building is the church of S. Mary the Virgin, at one time the church of an abbey. With its



Wymondham, Norfolk. Parish church of S. Mary the Virgin and S. Thomas à Becket, which formed part of the abbey church founded in the 12th century

founded in 1894 as a constituent of the university of London. This has a large farm, laboratories, and a library, and gives instruction in all branches of agricultural work. Pop. 1,454.

Wykehamist. Name applied to a boy who is or a man who was at Winchester College, taken from

and aisle, wooden roof, and rood screen, it is a magnificent building. Becket's chapel was founded in 1175 and restored 1886; it is now used for a library. There is a picturesque half-timber market cross, 1618. This town gives its name to the family of Wyndham. Pop. 5,500. Pron. Windham.

Wynants or Wijnants, JAN (c. 1615—c. 1680). Dutch painter. Born probably at Haarlem, where he seems to have passed the first part of his life, he removed in the 1660s to Amsterdam. His landscapes are carefully finished with fine atmospheric effects, and include figures and animals by contemporary artists. One of the founders of the Dutch school, he is said to have taught Wouwerman and A. van de Velde.

Wyndberg. Residential suburb of Cape Town, S. Africa. It is situated on the E. side of Table Mountain, 8 m. S. of the city proper, with which there is rly. connexion. It has an aerodrome. Near, at Constantia, is the government wine farm, Groot Constantia, its Dutch house dating from 1684.

Wyndham, SIR CHARLES (1837-1919). British actor. Born in Liverpool, May 23, 1837, he was the son of a doctor, and was himself educated for that profession. Having served as a surgeon on the Federal side in the American Civil War, he changed his



Sir Charles Wyndham,
British actor

name of Culverwell and took to acting, first playing in London in 1865. In 1874 began his connexion with the Criterion Theatre, where he played in a successful series of farces, and in comedies by H. A. Jones. In 1898 he left the Criterion for Wyndham's, in 1903 went to the New Theatre, and continued to appear on the stage almost until his death, Jan. 12, 1919. His most famous part was that of David Garrick. He was knighted in 1902, and his second wife was Mary Moore (q.v.), long his leading lady. His son, Howard Wyndham (1865-1947), succeeded to management of the three playhouses named, together with (Sir) Bronson Albery.

Wyndham, GEORGE (1863-1913). British politician and man of letters. Son of the Hon. Percy Wyndham and grandson of the 1st Lord Leconfield, he was born



George Wyndham,
British politician

Aug. 29, 1863. He was educated at Eton and Sandhurst, and went into the army, serving with the Coldstream Guards in Egypt in 1885. Forsaking a military

career for politics, he began as private secretary to Balfour, and in 1889 entered the commons as Unionist M.P. for Dover. In 1898 he was made under-secretary to the War office, and during 1900-05 was a secretary for Ireland well thought of for his land purchase bills. He died June 9, 1913. Wyndham wrote on Ronsard and Shakespeare, and in 1919 a volume of his *Essays in Romantic Literature* appeared. *Consult* Life and Letters, ed. J. W. Mackail and G. Wyndham, 1925.

Wyndham's Theatre. London playhouse in Charing Cross Road, W. 1. It was built for Sir Charles Wyndham, who became its first manager and director, the opening production being David Garrick, Nov. 16, 1899. The theatre, which seats 730, became noted for comedies and plays of topical interest: e.g. Mrs. Dane's Defence, 1900; Mrs. Gorrings's Necklace, 1903. Here Du Maurier appeared in A Kiss for Cinderella, 1916; Dear Brutus, 1917; and as Bulldog Drummond, 1921. Later pieces included Clive of India, 1934; George and Margaret, 1937; Quiet Wedding, 1938, and its sequel Quiet Week-End, 1941; The Years Between, 1945.

Wyntom, ANDREW OF (c. 1350-c. 1420). Scottish chronicler. A canon regular of St. Andrews, he was elected prior of S. Serf's monastery in Loch Leven, and when an old man began his chronicles at the request of Sir John of Wemyss. The Orygynale Cronykil of Scotland is a metrical history in the vernacular from mythical beginnings to 1406.

Wynyard, DIANA (b. 1906). British actress. Dorothy Isobel Cox was born in London, Jan. 16, 1906, and educated at Croydon. After making her debut by "walking on" in The Grand Duchess at the Globe Theatre, 1925, she toured for some years before scoring a success as Charlotte Brontë in Wild Decembers, 1933. Her reputation as an actress of somewhat statuesque charm was made in Sweet Aloes, 1934; meanwhile she had been starred in the Hollywood screen version of Cavalcade. Later stage appearances were in Design for Living, 1939; No Time for Comedy, 1941; Watch on the Rhine, 1942; The Wind of Heaven, 1945.

Wyoming. Mid-western state of the U.S.A. A perfect rectangle, it is bounded N. by Montana, E. by S. Dakota and Nebraska, S. by Colorado and Utah, W. by Idaho and Utah. Wyoming forms part of a great plateau (5,000-

7,000 ft.), and is traversed by branches of the Rocky Mts., culminating in Fremont Peak (13,790 ft.). The North Platte, Big Horn, Powder, and Green are the longest rivers, none of which is navigable. This is the 8th state in area, but is sparsely populated: only four towns have over 10,000 people, including Cheyenne, the capital.







The soil is for the most part arid, and agriculture, including the growing of alfalfa, sugar beet, and potatoes, has to be assisted by irrigation. Livestock is the principal source of wealth, though there are coal mines, natural gas, tin, sodium salts, and phosphate rock; and oilwells are so prosperous as to provide \$1,500,000 annually for schools, since land originally set apart to support education was found to be oil-bearing. The state has the largest elk herds in the world. It contains Yellowstone and other national parks. Communication is afforded by 1,923 m. of rlys., and there are some 50 airports.

Wyoming was the first state to give women the right to vote (1869), and had the first woman governor (1925). It sends to congress two senators and one representative. R.C.s just lead Mormons as the largest religious body. The state was admitted to the union in 1890. Area, 97,914 sq. m. Pop. 250,742. *Consult* Wyoming: Frontier State, V. Linford, 1947.



Wyoming Valley. Picturesque valley of Luzerne co., Pennsylvania, U.S.A. It extends about 23 m. along the N. branch of the Susquehanna river, and has a breadth of 3 m. Its possession was long disputed by Connecticut and Pennsylvania settlers, and on July 3, 1778, the former were attacked by a force of partisans of Great Britain and Seneca Indians and suffered defeat.

Wyss, JOHANN RUDOLF (1781-1830). Swiss author. The son of a pastor, he was born at Berne, March 13, 1781, and became professor of philosophy at the university there in 1806. He died March 31, 1830. His works include collections of Swiss folklore, but he is best known as the author of The Swiss Family Robinson (q.v.). This tale, which his father had told, was written down by the son and published in 4 vols., 1812-27, becoming a children's classic in all languages.

Wyvern. In heraldry, a two-legged dragon, with serpentine forked tail. It is the typical dragon of continental heraldry.

THE Egyptian hieroglyph most nearly corresponding to X was , representing a chair back. The later hieratic form was the first to add a cross-stroke, thus: , and the Semitic and Phoenician , adopting the letter, added others , also making the main stroke vertical , cal. Their name for the letter was *samekh*, meaning a post. The classic Greek *xi* was virtually the same letter with the vertical  stroke omitted. But



among several earlier Greek forms the two crossed diagonals had made their first appearance, though the relation between this form and the Semitic *samekh* is barely apparent. One theory is that the *samekh* was sometimes written , which would provide the missing link  in the chain. The crossed diagonals entered the classic Greek alphabet as *chi* (with a *k* sound), the *xi* being used for the *ks* sound. But the Romans adopted the diagonals for the *ks* sound, and developed the X

X Twenty-fourth letter of the English and twenty-third of the Latin alphabet. In form, but not in sound, it is the Greek X (*chi*), which answers to the German *ch* in *doch*, and the Scottish *ch* in *loch*. At the beginning of words, chiefly of Greek origin, it has the sound of *z*, e.g. *Xenophon*, *xylonite*. Its normal sound is that of *ks* in an accented syllable, as in *exit*, *excellent*, and of *gs* in an unaccented syllable as in *exert*, *exalt*. Before an unaccented vowel, with *i* or *u* following, it often has the value of *ksh*, as in *anxious*, *luxury*. See Alphabet; Phonetics.

Xanten. Old town of Germany, in N. Rhine-Westphalia. On the lower Rhine, 36 m. N.N.W. of Düsseldorf, it was founded by the Romans as *Vetera Gastra*, its name being a corruption of *Ad Sanctos*. It is mentioned in the Nibelung Saga as Siegfried's native town. A Roman amphitheatre still serving as an open-air theatre, and other remainders of the pre-Christian days; a mighty cathedral, partly Romanesque, partly Gothic, and next to that of Cologne in Rhineland fame; also S. Michael's church (1472-78), the town hall (1786), and old walls, attracted many tourists to Xanten. It had enamel, cement, and wood industries. The treaty of Xanten, 1614, ended the Julich-Cleves succession conflict.

During the Second Great War the town was almost destroyed, the cathedral suffering especially. One of the last places held by the Germans W. of the Rhine, N. of Coblenz, it was captured by Somerset Light Infantry after savage fighting on March 9, 1945. From here, on March 24, British engineers built their first Bailey bridge across the Rhine under heavy German fire which set the town ablaze. After the war Xanten lay in the British zone of occupation. Pop. 5,000.

Xanthe (Turk. *Eskiche*). Town of Greece, in Thrace, lying near an inlet of the Aegean Sea, and on the rly. 28 m. N.N.E. of Kavala. After the Balkan War and the par-

titution of Turkey in 1913 it passed to Bulgaria. After the First Great War it was transferred to Greece.

Xanthic Acid OR **XANTHOGENIC ACID** ($C_2H_2O_8$). Unstable oily liquid. Its crystalline potassium salt is obtained by the action of alcoholic potash on carbon disulphide and is used as a soil fumigant. Alkali cellulose when treated with carbon disulphide forms cellulose xanthate, used in making artificial silk.

Xanthine. White amorphous substance (2, 6-dihydroxypurine) belonging to the purine group, first isolated from a urinary stone. It is found in potatoes, coffee, beans, etc., but may be obtained from guanine or uric acid. Derivatives of xanthine include caffeine (1, 3, 7-trimethylxanthine), theophylline (1, 3-dimethylxanthine), and theobromine (3, 7-dimethylxanthine).

Xanthophyll. Yellow pigment. It is found associated with carotin and two kinds of chlorophyll in chloroplastids. It occurs with the former or alone in orange or yellow chromoplastids respectively. The chemical formula ($C_{40}H_{56}O_2$) assigned to it indicates the relation to carotin ($C_{40}H_{56}$).

Xanthus. Chief city of ancient Lycia, Asia Minor, situated on the river of the same name about 8 m. from the mouth. In 545 B.C. it was besieged by the Persians, and after its destruction by the Romans it fell into ruins. In modern times it has been the scene of archaeological excavations.

Xanthippè OR **XANTHIPPE** (Gr., yellow mare). Wife of Socrates (q.v.). She is said to have made his home life wretched by her quarrelsome disposition and shrewish tongue, and her name has become synonymous with virago. *Proem.* Zan-tippy.

Xavier, FRANCIS (1506-52). Spanish missionary and saint. He was born at Xavier, Navarre, April 7, 1506, and was educated in Paris. A family-proud, brilliant scholar and athlete, he at first scorned but later succumbed to the influence of Ignatius Loyola, with whom he was associated in

founding the Society of Jesus, 1534. He laboured in the hospitals of N. Italy, was ordained in 1537, founded the first Jesuit mission in India, at Goa, 1542, and visited Travancore, the Fishery Coast, Madura, Celebes, the Spice Islands, and Japan. He died of fever on the island of Sancien, near Macao, Dec. 2, 1552, while attempting to penetrate into China. Canonised in 1622, he has a festival on Dec. 3. He was the most practical of mystics, and inspired men by his life no less than by words. *See* Goa; Jesuits. *Consult* Lives, H. J. Cole-ridge, 1872; M. McClean, 1895; E. A. Stewart, 1917; Origin of the Jesuits, J. Brodrick, 1940. *Proem.* Span. Ha-veeairr; Eng. Zave-er.

Xebec (Ital. *sciabecco, zambecco*). Name for a three-masted lateen-rigged trading ship. It is used only in the Mediterranean.

Xenolith (Gr. *xenos*, stranger; *lithos*, stone). In geology, a piece of country rock enclosed in an igneous intrusion. Such inclusions are generally formed by the wedging off of fragments by the molten rock as it works its way upwards. They may be chemically converted into rock of the same composition as the intruding material, or become disintegrated and assimilated by the latter. Xenoliths, known also as heathen by quarrymen, are found in many granites. They form dark patches or clots which may be deleterious to weathering properties. *See* Granite; Igneous Rocks.

Xenon (Gr., strange). Rare gas. Ranking as a chemical element, it has the symbol Xe, atomic number 54, atomic weight 131.3. Colourless, invisible, and odourless, it exists in the atmosphere as one part in 170 millions.

Xenophanes (c. 570-480 B.C.). Greek philosopher. Born at Colophon in Asia Minor, he migrated



S. Francis Xavier,
Spanish Missionary

about 540 B.C. to Elea in Italy, where he founded the Eleatic school (*q.v.*). Xenophanes attacked the old religion which represented the gods as performing disgraceful actions. *Pron.* Zenof-aneez.

Xenophobia (Gr. *xenos*, stranger; *phobos*, fear). Term applied to the hatred felt by some people towards a foreign country, and towards those inhabiting it. The word is now rarely used, though analogous terms, specifying the hated nation, *e.g.* Anglophobe, hater of England, continue in use.

Xenophon (c. 430-c. 354 B.C.). Greek general and historian. He came of an Athenian aristocratic



Xenophon,
Greek soldier

family, and was taught by Socrates, whose idealism he revered although by nature a man of action. He fought probably at Arginusae in 406, but, opposing the

democratic regime, joined in 401 the Greek band of adventurers enlisted by the younger Cyrus of Persia for an expedition against Artaxerxes. After Cyrus's death in battle at Cunaxa and the assassination of Greek officers by Tissaphernes, the situation of this contingent was perilous. Xenophon's force of character and abilities brought him to the leadership, and he carried out one of the greatest retreats in military history, five months' marching through largely unknown country, beset with hostile tribes, to the Bosphorus. His *Anabasis* (*q.v.*), written in the third person, tells of this epic with such attention to detail and unassuming presentation of the author's determination and good humour that it has become a classic.

Xenophon transferred his allegiance to the Spartans, fighting in Asia, then at Coronea against the Athenians in 394, being by them proclaimed traitor and banished. Settling in Elis, he gave himself up to literature and sport, but was compelled to fly after the battle of Leuctra, and made probably his last home in Corinth. After the *Anabasis*, his chief book is *Hellenica*, which carries the history of Thucydides along to 362 and is the only authority for the 50 years covered. *Memorabilia* vindicates the memory of Socrates against charges of corrupting youth. There are also treatises on domestic economy, cavalry training, and

other military subjects, and a monograph on Agesilaus of Sparta, but in these the style becomes flat and only the detail is impressive. *Consult* Works, Eng. trans. H. G. Dakyns, 1890-96; *Ancient Greek Historians*, J. B. Bury, 1909; X., *Soldier of Fortune*, L. V. Jacks, 1930. *Pron.* Zennofon.

Xeres de la Frontera. Variant spelling of the name of the town Jerez de la Frontera (*q.v.*).

Xerophthalmia. Condition of the eye resulting in blindness. As it is caused by lack of vitamin A, cod liver oil is the essential remedy. The disease was rampant during both Great Wars wherever fats were unobtainable, and barrels of oil were sent to friend and foe alike to save children from incurable blindness.

Xerxes (c. 519-465 B.C.). King of Persia, 485-465 B.C. His first task on the death of his father Darius I was to quell a revolt which had broken out in Egypt. This accomplished, he was free to complete the vast preparations which his father had been making for the conquest of Greece, and in 480 Xerxes with his army of half a million men and a mighty fleet set out from Sardis in Asia Minor. The Hellespont was crossed by a bridge of boats, and to facilitate the progress of his fleet a canal was cut through Mt. Athos. He won the naval victory of Artemisium and his army, after a temporary repulse at Thermopylae, reached Athens, but his fleet was beaten at Salamis. Xerxes made his way home with the bulk of his army, and left the government thereafter to officials, devoting himself to the harem, as mentioned in the O.T. book of Esther. He was assassinated in 465 by Artabanus, commander of his bodyguard and an aspirant to the throne. Xerxes is the hero of Handel's opera *Serse*, and sings the aria known as Handel's *largo*. *See* Greece; Persia. *Pron.* Zerx-eez.

Ximenes, or Jimenes, de Cisneros, Francisco (1436-1517). Spanish ecclesiastic and statesman,



Francisco Ximenes,
Spanish ecclesiastic

born at Torrelaguna, Castile. After studying at Salamanca, he was ordained priest and went to Rome, where he remained, 1459-65. In 1481 he became vicar-general of Sigüenza and in 1492 confessor to Queen Isabella. In 1495 he was made archbishop of Toledo. Ximenes re-

tained his power during the difficult times that followed Isabella's death in 1504, receiving the red hat in 1507 and being grand inquisitor of Castile and Leon. This ascetic Franciscan had already signalled himself by an attempt to convert the Moors in Spain when in 1509 he led a strong force to Africa and conquered Mers-el-Kebir. On the death of Ferdinand in 1516 Ximenes became regent of Castile for Charles V, but was dismissed in Sept., 1517, and died Nov. 8. Founder of Alcalá de Henares university, he was a generous patron of literature. *Consult* Cardinal X. and the Making of Spain, R. Merton, 1934. *Pron.* Hee-may-nes.

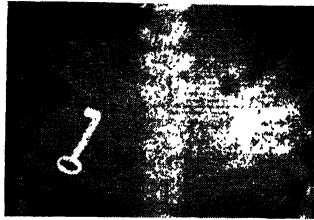
X-Rays. Rays whose existence was first discovered in 1895 by Röntgen. While investigating the passage of high-voltage electric currents through vacuum tubes (Crookes tubes) he noticed that rays were emitted which differed in properties from any known radiations. Although invisible, they caused fluorescence in certain crystals, notably the platino-cyanide of barium, and had the power of penetrating various substances opaque to light, such as wood and aluminium. The rays were stopped by the heavy metals and other dense substances. Röntgen named them X-rays to express his lack of knowledge of their nature.

There are two chief forms of apparatus for generating the high-voltage current used for X-rays: (1) the induction coil and mercury jet interrupter; (2) the high-tension transformer. There are two chief types of X-ray tube: (1) the "gas" tube; (2) the Coolidge tube. Both are vacuum tubes, but in the first a small residue of gas is left (about a millionth of an atmosphere). The electrons are usually emitted from a heated tungsten filament and accelerated by an applied H.T. voltage to strike the anode target. Most of the energy of the electrons is used in heating the anode, which has to be water-cooled, but about one p.e. is converted into X-rays.

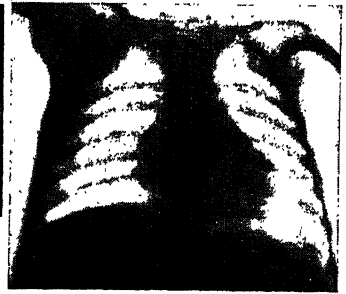
It has been found that each chemical element has the power of emitting X-rays of a particular wavelength—under suitable stimulation. This property is governed by a simple law: the square root of the vibration-frequency of each element is proportional to the atomic number of the element. This law has made possible many remarkable discoveries about the electron (*q.v.*) and the atomic structure of the elements.

In industry X-rays are applied with success in detecting flaws in metallic castings and the like. Improved apparatus has made possible the generation of X-rays of such power that they penetrate a considerable thickness of dense substances, such as steel. The applications of X-rays to medical diagnosis are numerous, in the detection and localisation *e.g.* of metallic foreign bodies, such as bullets and needles, and objects swallowed, such as coins, metallic toys, tooth-plates; of fractures and dislocations of bones; of diseases of bones and joints; of *calculi* in the kidneys and other parts of the urinary tract; of disease of the heart and lungs.

In tuberculosis X-rays are of incalculable value in detecting the early foci of consolidation in the lungs. When a quantity of a heavy insoluble salt (usually a com-



X-Rays as detectors of foreign bodies. A door key, swallowed by a child, and lodged in the gullet, is revealed by X-ray examination. Right, an open safety-pin, also lodged in the gullet, is similarly detected



more absorbent of the X-radiations and permitting of much shorter exposure. The X-ray tube being placed some distance above the patient or object, the plate, in a light-tight envelope, is laid immediately below. Exposure time ranges from a few secs. for arm or leg joints to one or two mins. for thicker parts of the body or for the skull. By the use of higher power or by placing a fluorescing screen in contact with the coated side of the plate, which is then exposed glass-side towards the tube, instantaneous snapshots can be made. Stereoscopic methods are used to determine the exact position of the object that

than any that can be manufactured. By using a crystal as a diffraction grating (the powdered crystal sometimes being mounted on metal), a pattern can be obtained on a photographic plate which makes it possible to calculate the structure of the crystal and the wavelength of the X-rays.

Xylene or **DIMETHYLBENZENE**. Liquid hydrocarbon obtained from coal-tar and existing in three isomeric forms, *viz.* orthoxylene, metaxylene, and paraxylene. Commercial xylene contains all three, but chiefly metaxylene. Xylene is used as a solvent and in making aniline dyes.

Xylophone (Gr. *xylos*, wood; *phonē*, voice). Percussion instrument in the orchestra. It consists of 27 bars of hard wood slightly rounded on the upper surface and arranged in two rows, with resonators below. They are struck with two small wooden mallets, producing by this means a dry and clattering tinkle of sound.

X Y Z Mission. Episode in U.S. diplomatic history. In 1798 three commissioners were sent to France by John Adams to inquire into the stopping and examination by the French of U.S. ships at sea. The three French agents who met them, termed X, Y, and Z in the commissioners' report, tried un-



X-Rays. Observing the organs of a patient's chest through a fluorescent screen

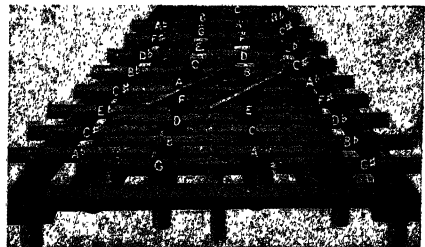
pound of bismuth or barium) is swallowed by the patient, X-ray examination can be made at intervals to observe the size, shape, position, and behaviour of the parts of the digestive tract.

Repeated exposure of the skin to the action of X-rays sets up a form of dermatitis. Certain diseases of the skin, however, yield readily to X-ray treatment, and ringworm is almost universally treated by X-rays. Some success has attended X-ray treatment of cancer, particularly surface cancers. Deep penetration rays can destroy deep-lying cells without injury to the surface cells.

In the making of photographs by X-rays, the results are shadows. Extra-rapid plates commonly used in photography will serve, but it is usual to expose plates or films coated with a type of emulsion

is being photographed.

X-RAY CRYSTALLOGRAPHY. It was found that X-rays do not obey the optical laws of reflection, refraction, and diffraction, when tested under normal conditions. They continue to travel in straight lines until stopped and absorbed by some dense substance, *e.g.* a heavy metal. It was, however, discovered that the wavelength of X-rays is some 10,000 times shorter than that of light waves, and the ordinary diffraction grating is therefore much too coarse to give a spectrum. The space-lattice made up by atoms in a crystal, however, is a natural grating much finer and more regular



Xylophone. Diagram showing arrangement of notes in the wooden musical instrument
By courtesy of Beatty & Hawkes

successfully to extort money as a preliminary condition of discussion. The issue of the report and correspondence in the U.S.A. almost led to war.

LIKE U, V, and W, the letter Y was developed from the Greek *upsilon* Υ . That is to say, it is closely related in its origin to the letter F (*q.v.*). The earliest form of the letter F, the Egyptian hieratic form, and the Semitic *vau* (hook) both retain, with emphasis, the two horns and the body of the original Egyptian hieroglyph representing an asp. These remain prominent



in the classic Roman Y, which had a usage derived from an uncial variant of the *upsilon*, called *psi* Ψ . The use of the letter Y for the Ψ sound of *th* in old English printed books, as in such words as "ye" for "the," arose from its resemblance to the Anglo-Saxon character \mathfrak{P} , thorn, which represented the sound. The word printed as "ye" was always pronounced "the."

Y Twenty-fifth letter of the English and twenty-fourth of the Latin alphabet, both a vowel and a consonant. In form it corresponds to the Greek Υ (upsilon), and in Latin is found only in Greek words. As a consonant it has almost the same value as *ee*, as may be heard in the pronunciation of *yes, yet*. As a vowel, *y* may be phonetically compared to *i*, its values being long *i*, the diphthong, not the Italian sound, and short *i*, as in *by, fly, synonym, system*. As a general rule, at the end of a word, when preceded by a consonant, it has a shortened sound, as in *colony*. Its only compound is *ye*, which has the value of long *i*, as in *bye, rye*. See Alphabet; Phonetics.

Yablonoi. Range of mts. in Siberia, U.S.S.R. Beginning E. of Lake Baikal, they trend from S.W. to N.E., and are continued by the Stanovoi mts. They are a northern prolongation of the Mongolian system. Greatest alt. is about 8,000 ft. Yablonoi means apple mts.

Yachting (Du. *jacht*). Navigation of a small vessel for pleasure, under either sail or motor or both. The word is believed to have been

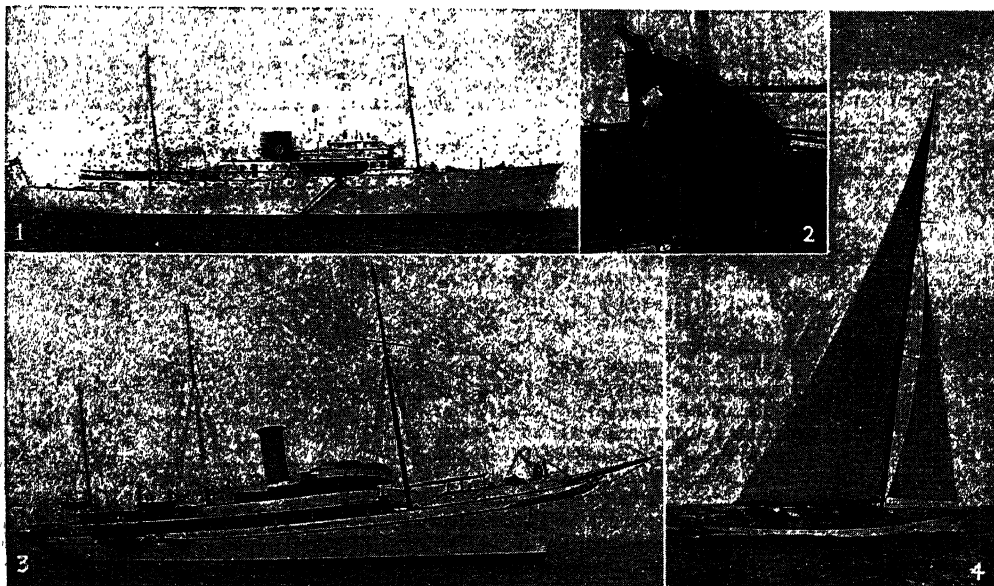
introduced into the English language in 1660 with the presentation by the Dutch of the *jacht* Mary to Charles II. Although Pepys in his diary records that the shipbuilder Phineas Pett built a number of yachts at Deptford, notably the Bezan, Cleveland, and Fubbs, to sail against the king's Mary, yacht sailing as a sport was not fully recognized until the water club of Cork was founded in 1720. Many 18th century yachts were rigged as brigs or topsail schooners, and even the smaller cutters followed almost exactly the style of the revenue cutters, carrying guns and strong crews to man them. Some yachts notable for their speed were taken into the navy as dispatch or "fly" boats, the brig *Waterwitch*, built by Whites of Cowes in 1834, being a well-known example.

Until the cutter *Arrow* was built of iron in 1848, yachts were built of the finest oak and pitch pine and teak. By the 1890s many yachts were "composite" built—with wood planking over steel frames (or ribs). In the 20th century some yachts were built almost en-

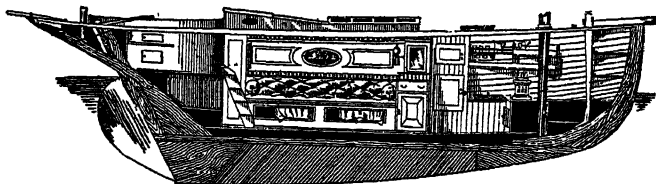
tirely of steel. In this the Dutch yacht yards led the way as supplies of local oak failed, building yachts of steel down to the smallest sizes of craft.

As a result of the sweeping victory of the schooner *America* when she outsailed 16 English yachts at Cowes and took the Queen's cup home with her in 1851, the trophy became known as the *America's Cup*. Presented to the New York yacht club, it has attracted many challenges from the U.K. Lord Dunraven, Sir Thomas Lipton, and T. O. M. Sopwith sailed specially built yachts to the U.S.A., but without success, the last races in this series being sailed between Vanderbilt's *Ranger* and Sopwith's *Endeavour II* in 1937. Prohibitive costs of such vessels have made further challenges with this so-called "J" class impossible.

So that yachts of widely differing size, hull forms, and rig could race together at regattas, attempts to evolve satisfactory measurement rules for handicapping were made as early as 1846. The difficulty in handicapping sailing yachts is that almost every yacht behaves differ-



Yachting. 1. A Diesel-driven yacht, the *Sans Peur*. 2. *Shamrock IV* in dry dock, showing the fine keel of the racing yacht. 3. Steam yacht *Iolanda*, when first built the largest in the world. 4. The racing yacht *Kaylena*

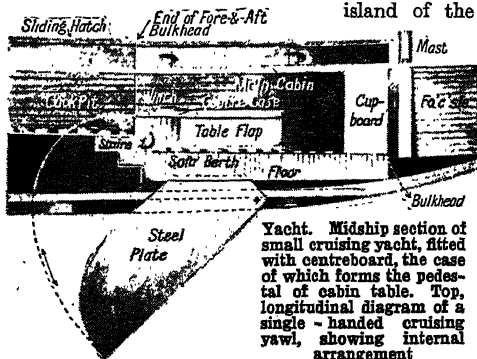


ently from the others in varying wind strengths and sea conditions. A yacht that may easily outsail a larger vessel in light breezes may be soundly beaten by the other if the wind pipes up.

The old tonnage rule introduced by the Royal Thames Yacht Club in 1854 as a rough-and-ready method of rating yachts continued in use in the U.K. as the Thames measurement yacht tonnage by which yachts are classed in size. For rating purposes, this was followed in 1880 by the length and sail area rule, which penalised beam to such an extent that during the next decade yachts became excessively narrow of beam. So that these "plank-on-edge" craft, as they were called, could carry their great spread of canvas, excessively deep and heavy lead keels were bolted on their bottoms, as a result of which they were named "lead mines." Various improvements in the rating rules produced a more healthy type, the finest and best loved of which was perhaps the cutter *Britannia* built by G. L. Watson in 1893 for Edward, prince of Wales.

The great days of racing between the big cutters and schooners, when kings and merchant princes vied for a cup and magnificent steam yachts lay at anchor in Cowes Roads, did not survive the First Great War. Attempts were made to revive the big class with *Britannia* under a new rig, Davis's great schooner *Westward*, Lipton's last *Shamrock* (the fifth), *Astra*, and *Velsheda*. But rising costs made yachting on such a scale beyond the reach of all but a very few rich men, and with the sinking of the old *Britannia* at King George V's behest in 1936, the class became defunct.

The Second Great War caused the loss on active service of many old steam and motor yachts, and a complete change in the character of yachting followed. Yachts with paid crews almost disappeared and the small cruising yacht with auxiliary motor or small full-power motor cruiser, handled by man and wife or a family, became popular. Many old yachts were turned into floating homes. Other



Yacht. Midship section of small cruising yacht, fitted with centreboard, the case of which forms the pedestal of cabin table. Top, longitudinal diagram of a single-handed cruising yawl, showing internal arrangement

quite small vessels of 10 tons and under made long voyages around the coast or about the world. Racing in the smallest boats gained greatly in popularity. There are more than 140 different classes of small racing boats in the British Isles alone. Chief races are for (a) one-design classes, in which all the boats of a class are built exactly alike to a single design, and only the skill of helmsmen or crew is presumed to be the winning factor; (b) restricted classes, in which boats are built within certain limits of length, beam, weight, sail plan, etc., and in which the best design is likely to win; (c) handicap classes, in which yachts of various sizes and types race on rating allowance, and the first one home does not necessarily win the race on "corrected" time; (d) the many dinghy classes, both national and international. The total number of all these small boats runs into several thousands in England alone.

Ocean racing—or coastal and off-shore racing—sponsored by the Royal Ocean racing club, was inaugurated in 1926; by 1948 races to Spain, Bermuda, the Netherlands, the Baltic, Ireland, and across Channel attracted some 120 British yachts of sizes varying from 24 ft. to 55 ft. on the waterline.

Maurice Griffiths, A.I.N.A.,
Editor, Yachting Monthly

Yacuiba. Town of Bolivia. On the Argentine frontier, in Tarija dept., it is an old settlement and trading point for the Gran Chaco. There is a rly. to Embarcación and Buenos Aires; a line to Villa Montes was nearly completed in 1948.

Yahoo. Degraded human servant of the horses inhabiting the island of the Houyhnhnms, described in the fourth voyage of Swift's *Gulliver*. See *Gulliver's Travels*.

Yak (*Bos grunniens*). Ungulate mammal, belonging to the ox family, and found only in Tibet and in parts of China. It is recognized by long hair which grows from the limbs, tail, and under parts

and often reaches the ground. It occurs both wild and domesticated, and in the former state its colour is dark brown. The yak is a massive and heavy animal, with short legs and a long narrow head. The bulls carry large cylindrical



Yak. Domesticated shaggy-haired bull of Tibet
Gambier Bolton, F.Z.S.

horns. Fine male specimens stand nearly 6 ft. high at the shoulders and weigh well over 1,000 lb. Yaks occur wild in the most rugged and inaccessible districts, and always at high elevations, as they are intolerant of heat. They have long been domesticated by the Tibetans, who use them as beasts of burden as well as for food.

Yakima. City of Washington, U.S.A., the co. seat of Yakima co. It is on the river of the same name, 155 m. S.E. of Seattle, and is served by the Northern Pacific and other rlys. In the vicinity half a million acres formerly desert now yield, by irrigation, grain, hops, and fruit. Incorporated 1886 as North Yakima, the city dropped the first word in 1917. Pop. 27,221.

Yakut. People of Turkic stock in the Lena basin, E. Siberia, R.S.F.S.R. Numbering 250,000, they are dark, flat-nosed, narrow-eyed, betraying Tungus contact. Cattle-breeders, hunters, and traders, they are also skilled artisans.

Yakutsk. Autonomous republic of the R.S.F.S.R. It extends from the Stanovoi mts. in lat. 55° N. to the Arctic Circle. The principal industries are hunting and gold mining. Fields are worked by a Soviet trust or individual prospectors; silver and lead-bearing ores and coal are also worked. One of the severest climates on earth and lack of rlys. have retarded development, but by 1948 the Angara-Lena rly. was nearing completion. Principal rivers are the Lena, Vilini, and Aldan. The capital, Yakutsk, stands 2 m. from the Lena, here 9 to 11 m. wide. A fort was established at Yakutsk in 1632, and trade developed in mammoth ivory, reindeer hides, and cattle. An air service connects the town with Irkutsk. Other places are Verkhoyansk (q.v.), Olekminsk, and Shigansk. Pop. 400,544.

Yale, ELIHU (1648-1721). Anglo-Indian official, benefactor of Yale university (v.i.). Born at



Elihu Yale, Anglo-Indian official

Boston, Lincs, April 5, 1648, he went to India on behalf of the E. India co. in 1672, became in 1687 governor of Fort George, and amassed a large fortune, which he spent

liberally on philanthropic and educational schemes. A governor of the co. from 1699, he died in England, July 8, 1721.

Yale University. One of the leading American universities in size, wealth, and reputation. It was founded in 1701 by a group of Congregational ministers at Saybrook, Conn., as a collegiate school. When removed in 1718 to New Haven, in the same state, it was renamed Yale College, in honour of Elihu Yale (v.s.), who had sent it a cargo of gifts. In 1887 it acquired the status of a university. It includes separate schools of medicine, divinity, law, etc., some of which are greatly indebted to private benefactors; thus its scientific dept., founded in 1847 with meagre resources, was developed in 1861 into the Sheffield scientific school, named after Joseph Sheffield (1795-1882),

whose gifts totalled more than a million dollars.

In the 1920s and 1930s the university was changed almost beyond recognition by benefactions from J. W. Sterling (1844-1918) and E. S. Harkness (1874-1940). Sterling doubled Yale's resources by leaving to it his residuary estate for the erection of new buildings and the foundation of professorships, fellowships, and



Yale University. Modern buildings of the university including the Payne Whitney gymnasium

scholarships. He is commemorated in the Sterling memorial library, a magnificent and technically up-to-date Gothic structure, containing more than 2,500,000 volumes, where 2,000 readers can be seated at one time. Harkness's gift of \$10,000,000 found embodiment in a tower and quadrangles, which, after the Oxford and Cambridge pattern, involved a radical departure from American tradition and a complete reorganization of the life of the undergraduates. These are divided, except in their freshman year, among eleven colleges. The staff of each college consists of a master and ten fellows, who supervise social life and supplement lectures by tutorial classes.

Older buildings are the Peabody Museum (q.v.) and the art gallery founded in 1832. Yale University Press issues, in addition to books, the Yale Review, one of the chief American quarterlies. An offshoot of the university was Yale-in-China, situated at Changsha. In 1947 Yale had 8,734 students, and a teaching staff of 1,012.

Yallowin. Town of Victoria, Australia, the centre of a state-owned electric power system with a capacity of 370,000 kW., supplying areas throughout the state. Pop. 3,600.

Yalta. Town of the R.S.F.S.R. Situated on the S.E. coast of the Crimea, 35 m. E. of Sevastopol and at the foot of the Yaila mts., it has long been a favourite watering place on account of its agreeable

and equable climate; mean annual temp. is 56°-5° F. The tsars had a summer resort here, the Livadia palace. Captured by the Germans in the Second Great War, Nov. 8, 1941, Yalta was retaken by Yermenko April 16, 1944. Here in 1945 was held the Yalta Conference (v.i.).

Yalta Conference. Name commonly given to a meeting, officially called the Crimea conference, held

Feb. 4-12, 1945, in the Livadia palace, Yalta, between Winston Churchill, prime minister of the U.K., J. V. Stalin, premier of the U.S.S.R., and F. D. Roosevelt, president of the U.S.A., with their military and technical advisers. Plans were made for the final stages of the campaign in Germany, and

subsequent occupation of that country, whose administration and control were to be co-ordinated through a central control commission consisting of the supreme commanders of the three powers and having its h.q. in Berlin; France was to be invited to take a zone of occupation and participate in the control commission [France accepted]. The calling of a conference of the United Nations to meet at San Francisco on April 25, to prepare a charter along the lines proposed at Dumbarton Oaks, was also agreed to, China and France to be consulted immediately and invited to sponsor invitations jointly with the U.K., the U.S.A., and Russia [China accepted; France refused]. Other decisions published at the time stipulated joint three-power assistance to the liberated peoples of Europe in rebuilding their economic and political life; and the setting up of a new "Polish provisional govt. of national unity" [in place of the exiled Polish govt. in London] and the establishment of the Curzon line, with minor digressions in favour of Poland, as that country's eastern border. Decisions not published were contained in an agreement of Feb. 11 which bound Russia to declare war on Japan two or three months after the surrender of Germany [this surrender was ratified May 8; Russia declared war on Japan Aug. 8]; and promised Russia, after the defeat of Japan, S. (Japanese) Sakhalin and the

Kurile Is., the internationalisation of the port of Dairen, re-establishment of Port Arthur as a Russian base, and Russo-Chinese control of the Chinese Eastern and S. Manchuria rlys. *Consult* Roosevelt and the Russians: The Yalta Conference, E. R. Stettinius, 1949.

Yalu. River of E. Asia. Rising in the Pei-shan, it follows a winding S.W. course between Manchuria and Korea, whose frontier it forms, to the Bay of Korea. It is about 300 m. long and navigable to Wiju (Gishu).

The battle of the Yalu was fought at the mouth of the river, Sept. 17, 1894, between Japanese and Chinese squadrons, the first action on a large scale in which breech-loading guns, quick-firers, and torpedoes were all employed. The Chinese were hampered by shortage of ammunition. The action lasted over four hours, at the end of which three of the Chinese vessels had been sunk, while a fourth had been beached owing to her injuries. Japanese loss was 90 killed and 208 wounded. The forcing of the passage of the Yalu by the Japanese in 1904 was one of the earliest land operations in the Russo-Japanese War.

Yam (*Dioscorea alata*). Perennial climbing herb of the family Dioscoreaceae. Though native to



Yam. Tubers and heart-shaped leaves

the East Indies and the Philippines, it is extensively cultivated in the West Indies. It has large, fleshy, tuberous roots, long twining stems, and alternate, heart-shaped leaves. The tubers are rich in starch, and are used

in the same ways as the potato. There are several other species in different tropical countries, with similar characters and uses, e.g. the Chinese yam (*D. batatas*), in which the tubers are of great length and more or less spindle-shaped.

Yama (Sanskrit, twin). In Hindu religion, god of the infernal regions and judge of the dead. The souls of the good journey to him by delightful ways, while the souls of the bad go by dismal paths.

Yamagata. ARITOMO, PRINCE (1838-1922). Japanese soldier and statesman. Born of Samurai family at Chosu, he took part in the over-

throw of the Tokugawa shogunate, became war minister in 1873, and helped to suppress the Satsuma revolt of 1877. Created count in 1884 he took charge of home affairs next year. He led the 1st army corps in the war against China, 1894-95, at the close of which he became inspector-general of the army and a marquis. He was field-marshal by 1896, and in the war against Russia was Oyama's chief of staff. Twice premier, 1889 and 1898, Yamagata wielded enormous influence as the outstanding Conservative statesman of his country. He was made a prince in 1907, having already received the British O.M. He died Feb. 1, 1922.

Yamashita, TOMOYUKI (ex. 1946). Japanese soldier. A student of German military tactics, he planned and carried out the Japanese attack on Malaya in Dec., 1941, receiving the surrender of the British commander in Singapore, Lt.-Gen. A. R. Percival, on Feb. 15, 1942. By the rapidity of this conquest he earned the nickname Tiger of Malaya. On March 9 he assumed command of Japanese forces in the Philippines, and on May 6 forced Lt.-Gen. Jonathan Wainwright, then in command of U.S. and Filipino troops, to surrender on Corregidor. When Gen. MacArthur returned to the Philippines, Oct. 20, 1944, Yamashita was driven from Leyte by Dec. 25, and defeated in Luzon between Feb. 4 and 24, 1945. With his remaining troops he took to the mts., surrendering unconditionally with his men at Baguio on Sept. 3 to Gen. Wainwright, sent specially from Tokyo. Brought before an American court martial in Manila on Oct. 8, charged with responsibility for atrocities including mass murder of civilians and the death by shooting, burning, or bayoneting of 141 out of 150 captured U.S. soldiers on Palawan, he was found guilty and condemned on Dec. 7 to death by hanging. Appeals were rejected by the U.S. supreme court (by six to two), by Gen. MacArthur, and by President Truman, and on Feb. 23, 1946, Yamashita was hanged near Los Banos in a field where Japanese had massacred captured American troops. *See* Tokyo Trials.

Yamethin. Dist. and town of Burma, in Meiktila division. The dist. lies W. of the Shan states, and is crossed by the Rangoon-Mandalay rly. Its area is 4,255 sq. m. The chief crops are rice and oilseeds. The town is on the rly. and the terminus of a main road to

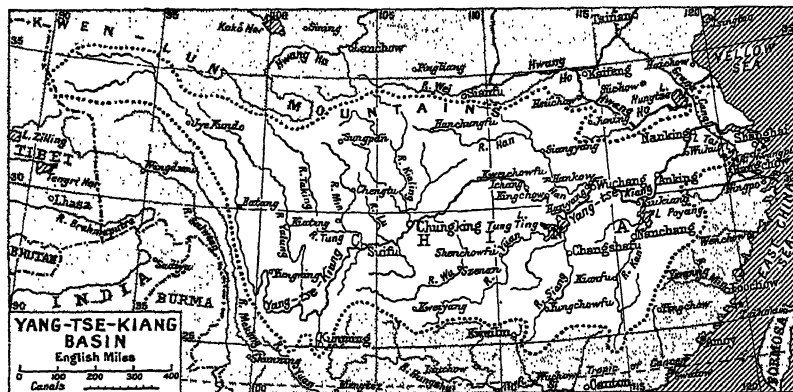
Meiktila and Myingyan. In Japanese occupation from 1942, the town was liberated by British and Indian troops on April 14, 1945. Pop., dist., 463,189; town, 13,200.

Yancey, WILLIAM LOWNDES (1814-63). American politician, born Aug. 10, 1814. He entered the legislature of his native Georgia in 1841 and three years later was sent to the house of representatives. Chief opponent of the abolition of slavery, he helped to put together the Alabama Platform, calling for government support for slave owners. He played a big part in the movement among the Democrats which led to the secession of Southern states in 1860. A Confederate senator from 1862, he died July 27, 1863.

Yang-tse-kiang. The principal river of China and the third (or fourth) longest in the world, its 3,400-m. course coming after those of the Amazon, Nile, (and Missouri-Mississippi, if these be counted as one). Taking its rise near the centre of the Tibetan plateau, it flows somewhat uncertainly S.E. to the Yunnan tableland, after which it turns N.N.E. So far its local name is Chinsha (river of golden sand), or Ulan-muran among the Tibetans. The next part of its course is marked not only by great loops and bends, but by dangerous rapids where it runs swiftly over a rocky bed. This part provides some of the most superb scenery in China in the Yang-tee gorges, stretching from Szechwan into Hupeh. Starting at something like 10,000 ft. above sea level, the river falls steadily at the rate of some eight feet per mile till it reaches the Hupeh plains.

From this point it is navigable as far as its mouth by river steamers; hence the enormous population living along its banks, and the merchants in large cities clustering at its mouth. For the last 1,200 m. the flow is reasonably slow and unimpeded by currents. As a means of transport, running roughly through the centre of China, the Yang-tee is of first importance. Ocean-going vessels of 6,000 tons can go as far as Hankow, 620 m. from the coast. Although the whole river is known to Europeans as Yang-tee (kiang meaning river), Chinese call it Ch'ang Chiang (long river), Ta Chiang (great river), or simply "the river."

Yankee. Word of uncertain origin used in America for a citizen of New England, and in Europe for a white native of the U.S.A. The name was applied in the War of Independence by the British to



Yang-tse-Kiang. Map showing the area drained by the Chinese river and its tributaries. See p. 8639

the Americans, in the Civil War by the Confederates to the Union soldiers (often shortened to "Yank"), and by the South to the North. A theory commonly advanced is that the word is a corruption of English, or Anglais, as used by the Massachusetts Indians.

Yankee Doodle. American tune dating from about the middle of the 18th century, its origin being obscure. One theory is that verses were written by an Englishman to deride the fantastically garbed colonial troops, and later adopted by Americans as a marching song. There are many versions. The earliest known example is in Aird's selection of airs for the fife, violin, or German flute (c. 1775). Words, more or less nonsensical in general, are fitted to it, such as:

Yankee Doodle came to town
On a little pony.
He stuck a feather in his cap,
And called it Macaroni.
Yankee Doodle, Doodle do,
Yankee Doodle Dandy;
All the lasses are so smart,
And sweet as sugar-candy.

Yannina. Greek form of the name of the Greek town described under the Serbo-Croat and more familiar spelling Janina. In Turkish the same place is Yaniya.

Yaoundé or YAUNDE. Capital of French Camerouns. It is about 200 m. by rly. E. of the seaport of Douala, stands on an affluent of the Nyong river, and is the centre of a system of roads. Pop. 50,000.

Yap. Detached island of the Caroline group, Pacific Ocean. The Carolines raised their flag here, and possessed Yap 1899-1914. Under the treaty of Versailles, 1919, it passed under mandate to Japan. It became an important cable centre with direct communication to Guam, Shanghai, and the N.E.I. The island is rocky, and produces bamboo and cocoa. Pop. 6,650.

Immediately after the treaty was signed friction arose between

the U.S.A. and Japan, as the cable from Yap was American-owned, but Japan claimed the right to manage it. A settlement was embodied in a treaty, signed Feb. 11, 1922, by which the U.S.A. obtained free access to the island to operate the cables free from Japanese control or censorship; also the right of residence and ownership of real and personal property. Contrary to the terms of her mandate, Japan fortified Yap, turning it into an air and naval base which she used in the Second Great War for her invasions of the Netherlands E. Indies, New Guinea, and the Solomons. When the Allies began their island-hopping campaign, they by-passed Yap, but they raided it from the air. The Japanese surrendered in the Carolines, Sept. 2, 1945. See Caroline Islands.

Yapp, SIR ARTHUR KEYSALL (1869-1936). British organizer. Born at Orleton, Herefordshire, March 12, 1869, he was educated at Hereford, and trained in business in Leominster, of whose Y.M.C.A. he became hon. sec. in 1890. Secretary of the Y.M.C.A. council for Lancashire, 1897, he was general secretary of the Manchester branch 1907-12, after which he became secretary of the national Y.M.C.A. council, and in 1929 deputy president. During the First Great War he became a public figure through his appointment as director of food economy, 1917-18, and he was knighted in the earlier year. He wrote *The Adventure of Youth*, 1929, and died Nov. 5, 1936. See Young Men's Christian Association.

Yapurá or JAPURÁ. River of S. America, in Colombia and Brazil. It rises in the Eastern Cordillera of the Andes in Colombia, where it is known as the Caquetá, and flows E. by S.; it picks up the Apaporis enters Brazil, and continues E.,

then S., to effect a junction with the Amazon in the neighbourhood of Teffe. Its length is about 1,450 m., of which 600 m. are navigable.

Yarborough, EARL OF. British title borne since 1837 by the family of Pelham. Charles Anderson-Pelham, a landowner in Yorks and Lincs, and an M.P. from 1768, was in 1794 created a baron. His son Charles

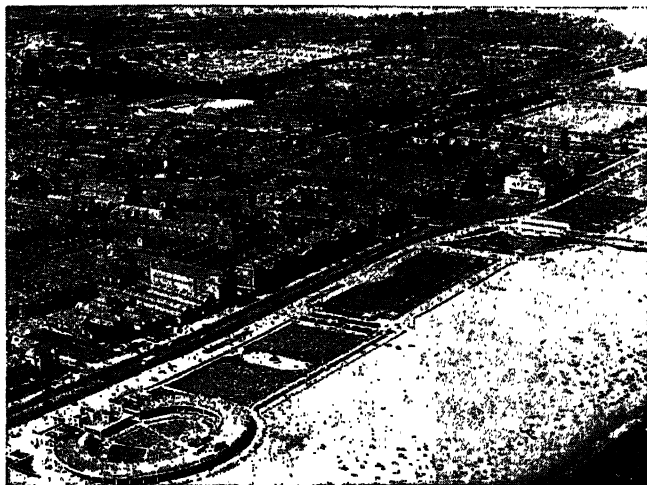
(1781-1846) was made an earl at the accession of Victoria, 1837. From him the title descended to Marcus, 6th earl (b. June 30, 1893), in 1948. The earl's seat is Brocklesby Park, Lincs.

A yarborough at whist or bridge is a hand containing no card above a nine; so named because a former earl of Yarborough used to offer 1,000 to one against a player being dealt such a hand. He stood to gain, for the true odds are given as 1,827 to one against.

Yard. British standard linear measure. It is the length between the centres of two gold studs on an iridio-platinum bar, copies of which are kept in the houses of parliament, the standards office, the Royal Observatory, and elsewhere. The yard is divided into three feet or 36 inches. It was originally a natural measure of length, usually the length of the arm of the king. The cloth yard is divided into four quarters or sixteen nails. See Ell; Weights and Measures.

Yardangs. In geology, rock ridges carved by wind action under desert conditions. They form parallel ribs up to 20 ft. high, fantastically carved in cross-section and separated by sandy hollows.

Yardley, NORMAN WALTER DRANSFIELD (b. 1915). English cricketer. Born March 19, 1915, at Barnsley, he went to St. Peter's, York, and St. John's College, Cambridge, winning his blue for cricket 1935 and captaining the XI in his fourth year. From 1936 he played for Yorks as an amateur, becoming captain 1947. Meanwhile, after playing for England in the tours to S. Africa 1938-39 and to Australia (as dep.-captain) 1946-47, he led the England side at home in the 1947 test matches



Great Yarmouth, Norfolk. Air view of the town, beach, and Marine Parade

v. S. Africa, those of 1948 v. Australia, and in three of those v. W. Indies, 1950. A forcing mid-innings batsman, he was also a medium-paced bowler effective in breaking stubborn partnerships. He published *Cricket Campaigns*, 1950.

Yare. River of Norfolk, England. It rises near Cranworth, and flowing E. past Norwich enters the sea at Yarmouth. It is about 60 m. long. Its chief tributaries are the Wensum, the Waveney, and the Bure.

Yarkand. Town of Sinkiang, China. Situated on the Yarkand, it is about 100 m. S.E. of Kashgar. It manufactures silken, felt, and cotton goods, carpets, and dyes. Early in the 17th century it was the capital of an independent kingdom. Pop. 118,562.

Yarkand-Daria. River of Central Asia. It rises in the Karakoram, in Kashmir, and flows W., N., and N.E. across the plain of Yarkand, W. China. After receiving various tributaries it takes the name of Tarim (q.v.).

Yarmouth, GREAT. Co. bor., seaport, and holiday resort of Norfolk, England. Standing near the mouth of the Yare, it is 19 m. E. of Norwich, and is served by rlys. Characteristic of Yarmouth are its Rows, lanes often but a few feet wide, running between the river



Great Yarmouth arms

and the sea. Fragments of the 14th century town walls still remain, and there are some interesting old houses, including the town hall, and the Star Hotel, a Tudor

building which contains a Nelson room and memorials of that admiral. There is a harbour on the Yare, with extensive quays on which are a large fish market and shipbuilding yards. The principal trade is in fish, especially the autumn catch of herrings. There are also engineering works, timber yards, and silk and food processing industries. On the Denes, S. of the town, is the Nelson monument, a column 144 ft. high. There are a marine parade, two piers, sporting facilities, and a splendid stretch of sand which extends as far as Gorleston, part of the borough. Yarmouth is the name of a co. constituency. Pop. est. 48,697.

On Nov. 3, 1914, and on April 25, 1916, German battle cruisers bombarded Yarmouth, and on Jan. 14, 1918, torpedo-boat destroyers fired 50 shells into the town, four persons being killed. Raids in the Second Great War destroyed the parish church of S. Nicholas, dating from 1101 and among the biggest in England; and the 14th century toll house.

Yarmouth. Seaport of the Isle of Wight, England. Standing on the Solent, at the W. end of the island, and at the mouth of the river Yar, it has a station on the island rly. and steamer connexion with Lympington.

The chief buildings are the town hall, the church, and the castle, but Yarmouth is mainly a yachting centre. Until 1893 it had its own mayor and corporation, and it sent two members to parliament from 1584 to 1832. It was burned by the French in 1377 and 1544. Pop. 823.

Yarmouth. Town and seaport of Nova Scotia, Canada. It is 215 m. S.W. of Halifax, in Yarmouth co., on a good harbour at the S.W. end of the peninsula, and is a station on the C.P.R. and the C.N.R. From here steamers go to Boston and Halifax. The chief industries are in fish products and exporting lumber. Pop. 7,790.

Yarn. Textile thread, of great length, suitable for making into cloth by weaving or knitting. Yarn is produced by the processes of spinning, and consists of numbers of individual fibres held together by twisting them round one another. There are two types: nett, in which individual fibres are very long and continuous; and spun, in which fibres are short and overlapping. The only nett yarns are silk and the man-made rayons, nylon, etc.; wool, cotton, and linen are of necessity spun.

The fineness of yarn is indicated by a counts number. For nett yarns this is the denier, or weight in grams of 9,000 metres. For spun yarns it is usually the number of hanks of a standard length which weigh 1 lb., but woollen, worsted, cotton, linen, etc., yarns each have their different standard length of hank. The product of one unit of the spinning machine is termed a singles yarn; two or more of these twisted together form a ply, or doubled yarn; two or more ply yarns twisted together form a cabled yarn.

Other designations may be added, indicating type of raw fibre used; method of spinning (mule or ring); scoured, bleached,



Yarmouth, Isle of Wight. The town square, showing the church and Town Hall (right)

or dyed; whether for warp, weft, or knitting, or a special type such as cr pe. Fancy yarns are made by plying together singles of different materials, or different counts and colours, or by using singles containing deliberate irregularities. See Counts; Lisle Thread; Spinning; Weaving.

Yaroslav OR YAROSLAVL. Town of the R.S.F.S.R., capital of Yaroslavlsk region. It lies on the right bank of the Volga, where the Kotoros enters it, 174 m. by rly. N.E. of Moscow. Founded by Yaroslao the White in 1024, it has in the Uspinski cathedral a building started in 1215, rebuilt, 1646-48; other churches date from the 15th and 17th centuries. The chief town of a principality 1218-1471, it then fell to Moscow. A place of some 70,000 pop. with cotton and linen mills, flour mills, and tobacco factories at the time of the Revolution, it was developed under the Soviet regime as an engineering and chemical-making centre, pop. in 1939 being 298,000. It suffered some damage in the civil conflict in 1918, but remained outside the battle area throughout the Second Great War. The name Jaroslaw (*q.v.*) of a town in Poland is sometimes spelt Yaroslav.

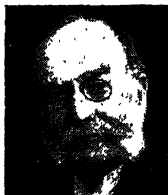
Yarra Yarra. River of Victoria, Australia. Flowing W., it discharges into Port Phillip and is navigable for large vessels to Melbourne. Its length is 100 m.

Yarrow (*Achillea millefolium*). Perennial herb of the family Compositae, native of Europe, N. and W. Asia, and N. America. A common weed in British pastures, and closely related to the sneezewort (*q.v.*), it differs in the long leaves being cut into fine segments, featherwise, and in the flower-heads being smaller, but more numerous.

Yarrow. River of Selkirkshire, Scotland. It rises above St. Mary's Loch (*q.v.*) and flows thence E.N.E. to the Ettrick Water, which it joins near Selkirk. Only 14 m. long, it is known for its historic and literary associations and for the beautiful scenery through which it flows. On its banks are the ruins of a castle of the Douglasses, Dryhope Tower, and Newark Castle. In verse the Yarrow has been immortalised by the Border ballads and by Hogg and Wordsworth.

Yarrow, SIR ALFRED FERNANDEZ (1842-1932). British engineer. Born Jan. 13, 1842, he was educated at University College School. He founded in 1866 the firm of Yarrow and Hedley, shipbuilders

and engineers, at Poplar, London, where he specialised in high-speed vessels, particularly torpedo-boats and destroyers, craft of shallow draught, and the Yarrow boiler now generally adopted in the navies of the world. In 1906 the works of Yarrow and co. were removed to Scotstoun, Glasgow, and later a branch was opened at Vancouver. Yarrow was created a baronet in 1916, and died Jan. 24, 1932.



Sir Alfred Yarrow,
British engineer

Yasghulami. Language of the Galcha sub-group of the Iranian branch of Aryan speech. It is spoken in the Yasghulam or Yazdum valley, between the Roshan and Darwaz hill tracts, Uzbek S.S.R. The language was unknown until a short vocabulary, collected by Stein in 1915, showed that this dialect has preserved in isolation early Aryan characteristics.

Yashmak. The veil sometimes worn by Mahomedan women in Egypt, and formerly in Turkey, when in public. Triangular in shape and about a yard long, it covers the face below the eyes.

Yataghan. A Turkish short sword or long knife, with a double curved blade running to a point and a handle without a guard. The back of a yataghan is much straighter than the cutting edge. The weapon is common among Mahomedan peoples.

Yates, DORNFORD. Pseudonym of Cecil William Mercer (b. 1895), British novelist. Born Aug. 7, 1895, he was educated at Harrow and University College, Oxford; was called to the bar at the Middle Temple in 1909; and served in both Great Wars. His tales were either slightly farcical or full of adventure, and the Berry series became popular with a wide public, starting with Berry and Co. Other novels included *The Brother of Daphne*, *The Courts of Idleness*, *Valerie French*, *Blood Royal*, *Fire Below*, *Red in the Morning*.

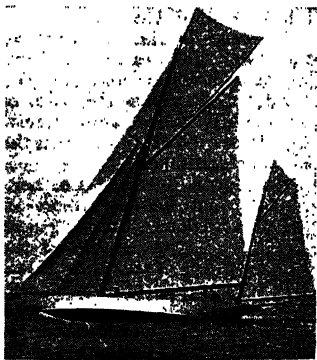


Dornford Yates,
British novelist

Yates, EDMUND HODGSON (1831-94). British journalist. Born in Edinburgh,

July 3, 1831, he held an appointment in the G.P.O., 1847-72. He began journalistic work as a contributor of verses and theatrical criticism to *The Court Journal* in 1852; and was dramatic critic and reviewer on *The Daily News*, 1854-60. As editor of *Town Talk*, 1858, he wrote an article on Thackeray which led the latter to insist on his resignation from the Garrick Club; it was Dickens's support of Yates over this dispute which led to the prolonged estrangement of Dickens and Thackeray. Yates became acting editor of *Temple Bar*, 1860; sole editor, 1863. He edited *Tinsley's Magazine*, 1867-74; was European representative of *The New York Herald*, 1873; and founded a society paper, *The World*, 1874. He founded and edited *Time*, a monthly, 1879-83. Yates produced novels, among which *Black Sheep* was dramatised; also *Recollections and Experiences*, 2 vols., 1884. He died suddenly in the Savoy Hotel, May 20, 1894.

Yatton. Village of Somerset, England. It is a rly. junction lying 8 m. N. of Axbridge. Here is a splendid church with many E.E. and Perp. features. One of the oldest pieces of embroidery in the county is preserved here. Pop. 2,280.



Yawl. A racing yawl sailing close to the wind

Yawl. Name for a two-masted craft. The mainmast is tall, and carries several sails; the mizzenmast is short, and carries only one small sail, which, projecting over the stern, helps to make steering easy. See Reefing illus.; Ship.

Yawning (A.-S. *geonian, gánian*). Deep involuntary inspiration associated with stretching of the muscles. It is due to an effort of nature to correct over-venosity of the blood resulting from fatigue.

Yaws. Another name for the tropical disease *Framboesia* (q.v.).

Yazd. Variant spelling of *Yezd* (q.v.), the name of a prov. in central Persia and its capital.

Yazidi. This Iraqi sect of devil-worshippers is also known as *Yezidi* and so described.

Yeaddon. Part of the urban dist. of Aireborough, in the W. Riding of Yorks., England. Yeaddon, which is 7 m. N.W. of Leeds, has a woollen industry, and the joint municipal airport for Leeds and Bradford.

Yeames, WILLIAM FREDERICK (1835-1918). British artist. Born at Taganrog, Russia, where his

father was British consul, he studied art in Florence and London, where he was associated with Calderon, Marks, and others in the St. John's Wood school.



W. F. Yeames,
British artist

Made A.R.A. in 1866 and R.A. in 1878. Yeames taught in the academy school and was its librarian; also curator of the Painted Hall, Greenwich Hospital. Some of his dramatic representations from history secured an enormous popularity, e.g. *Amy Robsart*; *When Did You Last See Your Father?*; *The Toast of the Kit-Cat Club*. He died May 3, 1918. Consult *Art and Anecdote*, M. H. S. Smith, 1927.

Year. Period of time. A number of different years are recognized. The sidereal year is 365 days, 6 hours, 9 minutes, 9 seconds, and is the actual period taken by the earth to make one complete revolution in its orbit. The anomalistic year, the interval between two successive passages of perihelion by the earth, is 365 days, 6 hours, 13 minutes, 53 seconds. The tropical year is 365 days, 5 hours, 48 mins., 46 secs., the time taken by the earth to pass from any point in the ecliptic to the same point again.

The tropical year is that of the calendar, and is divided into 12 months, each separately described. Extra hours and minutes over 365 days are taken into account by the addition of one day in every fourth year, with the exception of such century years as are not

divisible by 400. Jews and Mahomedans use a lunar year. The Jewish normal year consists of 354 days, and to make up the difference between that and the solar year, an embolistic year of 384 days is introduced periodically according to complicated rules. The number of these days may be increased or decreased by one if certain festivals fall within the period. The Mahomedan year is 354 days, so that the beginning of year recedes through the seasons in about 33 years. See *Calendar*.

Year Book. Book of reference containing facts, statistics, etc., and published annually. The name is also used for the series of English law reports from the time of Edward II to that of Henry VIII. See *Almanac*; *Annuals*.

Yearsley, ANN (1756-1806). English poet. Of humble parentage, the "Bristol milkwoman" was befriended by Hannah More, who helped her to bring out in 1784 a volume of verses. Longer poems appeared at intervals on such topics as the slave trade and the executions of royalty in the French Revolution. A tragedy, *Earl Goodwin*, was played at Bath and Bristol in 1789. The *Royal Captives*, 1795, was a romance about the Man in the Iron Mask. Mrs. Yearsley, who died at Melksham, May 8, 1806, was praised by Horace Walpole and Southey, and called by Miss Seward "a miracle."

Yeast. Class of fungi of the genus *Saccharomyces*. They have the power of setting up alcoholic fermentation in sugar, the latter being broken up in the process into alcohol and carbon dioxide. Among the chief varieties of yeast are *S. cerevisiae*, used in making beer, and *S. ellipsoideus*, in wine. *S. mycoderma* is the so-called vinegar plant. If a small quantity of yeast is introduced into a fermentable liquid, the yeast cells increase and the liquid actively ferments. For the growth of the plant a suitable temperature is necessary—about blood heat—and the presence of nitrogenous and mineral matter. Fermentation may easily be induced by exposure of a suitable liquid in the warm atmosphere of a brewery, where the air is full of minute dust-like yeast spores.

The action of yeast is due to certain enzymes present in the cells. Fermentation can be brought about by the juice of the cells in the absence of the living organism. The fermenting liquid is covered with a frothy mass, known as top yeast, which is compressed and used by bakers. Yeast settling at the bot-

tom of the vessel is known as bottom yeast. Commercial dried yeast contains a considerable addition of starch. Yeast is an important source of vitamins. See *Fermentation*; *Vitamins*.

Yeast. Novel by Charles Kingsley, first published in *Fraser's Magazine* in 1848. It has a rural setting and is a passionate denunciation of the condition of British agricultural labourers at that time, particularly of the insanitary state of their homes—the heroine dies of typhus contracted while visiting cottages on her father's estate. It was intended to rouse landowners to realization of their duties to those who lived on their estates.

Yeats, JACK BUTLER (b. 1871). Irish painter. Brother of W. B. Yeats, he was educated privately and taught painting by his father. With great vitality and boisterous humour, he depicted scenes of Irish landscape and life; his colour and method of presentation were highly individual. Yeats is represented in the Tate, Birmingham, Dundee, and many Irish galleries. Governor of the national gallery in Dublin, he published *Life in the West of Ireland*, 1921; *Sailing, Sailing Swiftly*, 1933; *The Charmed Life*, 1938; *The Careless Flower*, 1947.

Yeats, WILLIAM BUTLER (1865-1939). Irish poet and writer. He was an artist's son, born at Sandymount near Dublin, June 13, 1865. His upbringing was largely in co. Sligo, whose place names occur throughout his early verse, and where he was later to reside, on the island of Innisfree in Lough Gill. During 1895-1919 he was mostly living off Woburn Place in London. He died Jan. 28, 1939, at Roquebrune on the French Riviera; and in 1948 his remains were brought back to Sligo and laid, according to his prophecy, in Drumcliffe churchyard.

First poetic efforts appeared in 1889, a long narrative, *The Wanderings of Ossin*, and short pieces collected as *Crossways*. There followed quickly a first verse play, *The Countess Cathleen*; a volume of essays, *The Celtic Twilight*; and a one-act drama, *The Land of Heart's Desire*, which is still acted. Yeats, a familiar of Huxley and Morris, and about to contribute to the *Yellow Book*, divided his time between verse and prose, drama and essay. With Lady Gregory he was in 1899 an inaugurator of the Irish literary theatre, soon to establish itself in Dublin as the Abbey Theatre with Yeats a director. The dreamy though often

magnificent poetry in his own work, such as *Deirdre*, did not suffice to stem the tide of theatrical realism,



William Butler Yeats. Left, as a young man; right, in later life

and more material success attended his plays in prose, e.g. *Cathleen ni Houlihan*; *The Hour-Glass*. Meanwhile *The Wind Among the Reeds*, a volume which some lovers of Yeats call their favourite, was making his name at the turn of the century for the most persuasive voice from the "Celtic fringe."

It is customary to speak of the earlier and the later Yeats; certainly, if the loveliness of the earlier poetry is at times overloaded with imagery, this tendency was completely reversed in the search for an austerity of style at the risk of obscuring the message. *Responsibilities*, 1914, is perhaps the collection which bridges the two phases; it also draws on national themes. There is enduring work in *The Wild Swans at Coole*, 1919; *The Tower*, 1928 (which contains *Sailing to Byzantium*); *The Winding Stair*, 1929. As mysticism grew more profound and symbolism more personal, some spontaneity of emotion may have vanished, yet his output in the 1930s stamped Yeats as a creative genius, ready to absorb new theories and explore spiritual worlds, mixing, if he could, theology, Platonism, and Irish mythology. He never lost his command of the phrase that falls like a hammer or quietly steals the breath; and has probably struck off more jewels in eight or fewer lines than any writer in English since Landor (one of his models).

In the theatre he was an experimenter to the end. Four Plays for Dancers, 1921, and *The Words Upon the Window-Pane*, 1930, were based on the unrealistic drama known in Japan. *Purgatory*, another play, seems to have been his last work. Criticism was represented by such volumes as *Ideas of Good and Evil*, 1903; *Plays and Controversies*, 1923. Yeats helped as a young man to edit Blake; and in age made for the Abbey Theatre translations of Sophocles. *Reveries over Childhood and Youth* came

out in 1915; *The Trembling of the Veil*, 1922, and *Dramatis Personae*, 1936, were autobiographical.

The potency of Yeats in the literary revival of his country was recognized by his being made a senator when the Free State was founded, and awarded in 1923 the Nobel prize for literature. A tremendous talker, he was something of a dictator on subject matter, but nobody questioned his supremacy. "We were the last romantics," he claims "—chose for theme traditional sanctity and loveliness." Incomparably the most lofty and idealistic Irish poet, he may come to occupy a place among the rarest circle of all. The fullest study is by J. Hone, 1943; consult also *Some Memories of W. B. Yeats*, J. Masefield, 1941; *Towards a Mythology*, P. Ure, 1947. *Pron. Yates*.

Yeats-Brown, FRANCIS (1886–1944). British author. Born Aug. 15, 1886, at Genoa, son of the British consul-general, he went from Harrow to Sandhurst. Commissioned in the cavalry in 1905, he joined his regt. on the N.W. Frontier. During the First Great War he served in France and Mesopotamia (Iraq), being a prisoner of the Turks 1915–18. His first book, *Caught by the Turks* (1919), gave a vivid description of his experiences. He retired from the army in 1925 and was for three years assistant editor of *The Spectator*. In 1930 he published *Bengal Lancer*, a semi-autobiographical volume, and an unusual mixture of mysticism and militarism. He then wrote *Golden Horn*, 1932; *Dogs of War*, 1934, an answer to pacifists; *Yoga Explained*, 1937; *Indian Pageant*, 1942. Yeats-Brown died Dec. 19, 1944.



Francis Yeats-Brown, British author

Yecia. Town of Spain, in the prov. of Murcia. It stands on the W. slope of the Monte Castillo, 17½ m. by rly. W. of Villena and 44 m. N. of Murcia. It was important in Roman times. In the vicinity are vestiges of Roman and Sarcenic dwellings. There is a trade in wine, oil, fruit, and esparto. Pop. 25,300.

Yedo. Historic name, in use until 1868, for Tokyo (*q.v.*).

Yeffren or **IEFFREN**. Town in Tripolitania. Situated 60 m. S.S.W. of Tripoli on a caravan route, it is the capital of the surrounding region, and was captured by the

Italians, March 27, 1913. The pop. consists of Arabs and Berbers.

Yell. Island and parish of the Shetland Islands, Scotland. It is 25 m. N. of Lerwick, and is separated from the mainland by Yell Sound. The island is 17 m. from N. to S. and varies in breadth from 2 to 6 m. The surface, barren and bleak, rises in parts to over 600 ft. Pop. 2,300. See Shetland Islands.

Yell, COLLEGE. Kind of battle-cry or war-whoop used by American college students to encourage their own teams in football matches or other athletic encounters. It consists of the rhythmical shouting of a number of words or syllables, usually including the name of the college itself. Typical examples are: Rah rah rah, rah rah rah, rah rah rah, Harvard; Rah rah rah, rah rah rah, rah rah rah, Yale; Ray ray ray, tiger tiger tiger, sis sis sis, boom boom boom, ah ah ah, Princeton Princeton Princeton; Cornell, I yell yell yell, Cornell. A difference between the yells of Harvard and Yale is the length of time taken to give them: Harvard's yell is long and deep, whereas Yale's is quick and sharp. In several instances the college name is spelt out, as in C-o-l-u-m-b-i-a, ra ra ra, C-o-l-u-m-b-i-a.

Yellala. Falls on the Congo river, in Belgian Congo. About 25 m. above Matadi, they consist of a succession of rapids which here block the river to navigation.

Yellow Book, *THE*. Illustrated British quarterly, of which 13 vols. were issued, 1894–97. Published by John Lane, and edited by Henry Harland (*q.v.*), it was intended to provide a medium for writers and artists who were not in sympathy with the more conventional forms of expression, and was therefore the "highbrow" magazine of its day, making no concession to popular appeal. Its name has become a symbol for that mildly shocking and highly self-conscious, if somewhat ineffectual, style in creative art which characterised the period known as *fin-de-siècle*. The taunt of decadence levelled against *The Yellow Book* was probably due first to the remarkable drawings by Aubrey Beardsley, and secondly to the reaction against the theory of "art for art's sake" which followed the trial and imprisonment of Oscar Wilde. Max Beerbohm was a frequent contributor, and early stories by Arnold Bennett and H. G. Wells were printed in *The Yellow Book*.

Yellow Fever. Acute non-contagious fever of several types, occurring in endemic form in the

monkeys and human inhabitants of the coastal forests of Mexico and Central S. America, on the W. coast of Africa, etc., and epidemic in the towns near by. The disease is caused by a filtrable virus and spread by a species of mosquito (*Aedes aegypti*). Disinfection with D.D.T. of its breeding places lessens the incidence of the fever.

Symptoms generally appear about seven days after infection has occurred. There is a rise of temperature to 103° F. or more, with sensations of chilliness, severe headache, pain in the back and limbs, and increase in the pulse rate. After two to four days the temperature falls, the pains become less, and in some cases the patient steadily improves. More often, after a few hours' remission, the temperature again rises and jaundice appears, the yellow tint of the skin gradually increasing. This symptom has given the disease its name. In some cases the symptoms decrease in three or four days and the patient gradually recovers. In others the jaundice becomes deeper, followed by coma and death. Mortality is usually estimated at 10 to 25 p.c. for the U.S.A., and 45 to 80 p.c. in West Africa. Serum offers a temporary protection, the modified virus used as a vaccine giving immunity for some years. The disease being established, the only treatment is good nursing.

Yellowhammer (*Emberiza citrinella*). Species of bunting,



Yellowhammer.
Species of bunting
W. S. Berridge, F.Z.S.

common in Great Britain and N. Europe. The head, neck, and under parts are bright yellow, while the upper parts are reddish-brown. It occurs chiefly on commons and waste ground, and feeds upon insects during summer and upon seeds in winter. See Eggs: colour plate.

Yellowhead. Pass in the Rocky Mts., Canada. It is on the borders of Alberta and British Columbia, W. of Jasper Park, and was discovered in 1858. See Rocky Mts.

Yellow Journalism. Term originating in the U.S.A. and denoting newspapers of a sensational and reckless character. It first came into vogue during the 1890s, when Pulitzer's New York World and W. R. Hearst's New York

Journal competed with each other to secure the larger circulation. At that time it had special reference to attempts of the popular press to whip up opinion in favour of war with Spain. The term is believed to have been suggested by an experiment in the New York World in the new art of colour printing, in which a child in a yellow dress (the Yellow Kid) was the central figure in a series of cartoons.

Yellow Peril. Term used for the danger to the white man anticipated from the settlement of persons of the so-called yellow races, i.e. Chinese and Japanese, in lands belonging to the white man. The danger rests upon the differences in the standard of life between the two races, and the greater fecun-

Mts. in Wyoming, and flows N.W. to the Yellowstone Lake, thence over the Great Falls, and through the Grand Cañon. Entering Montana, it bends E. and finally turns N.E. to join the Missouri just across the frontier of N. Dakota. Its principal affluent is the Big Horn, to the confluence with which it is navigable. Its length exceeds 1,000 m.

Yellowstone Park. Government reservation of the U.S.A. Occupying the N.W. corner of Wyoming and small adjoining portions of Montana and Idaho, it covers an area of 3,350 sq. m. and was opened to the public in 1872 as a national park with game reserve. It consists mainly of a plateau relieved by mountain groups and has a general elevation of about 8,000 ft., the loftiest



Yellowstone Park. American national park and game reserve, famous for its hot springs and volcanic scenery

dity of the yellow one. Eventual supremacy of the yellow man was prophesied by C. H. Pearson in National Life and Character, 1893.

Yellow River. The Chinese call this river Hwang-ho (*q.v.*).

Yellow Sea (Chinese Hwang-hai). Arm of the Pacific Ocean, lying between Manchuria on the N., China on the W., and Korea on the E. It washes the shores of the Chinese provs. of Hopei, Shantung, and Kiangsu, and the Manchurian S. coast, and communicates on the S. with the Eastern Sea. The N. portion embraces the gulfs of Korea, Liaotung, and Chihli, and the most prominent projections into it are the peninsulas of Liaotung and Shantung. The river Hwang-ho brings down enormous quantities of yellow mud, and from this the sea receives its name. It is a shallow expanse of water, nowhere exceeding 300 ft. in depth. Its maximum width is 400 m. and its shortest is 115 m., between Korea and Shantung.

Yellowstone. River of the U.S.A. The largest tributary of the Missouri river, it rises in the Rocky

summits, most of them of volcanic character, reaching between 10,000 and 12,000 ft. Within the reserve are over 3,000 hot springs and several magnificent geysers, some throwing water to a height of 250 ft. The Grand Geyser in the Firehole basin is regarded as the most majestic in the world. Dazzlingly coloured terraces have resulted from eruptions of geyser water. Roaming in the park are elk, moose, bear, and antelope. Near its centre is Yellowstone Lake, an irregular body of water, 7,745 ft. alt., with a greatest length of 20 m. and an extreme breadth of 15 m. Other water expanses are the Shoshone, Heart, and Lewis lakes.

The Yellowstone river, which enters the lake at the S. end and issues from the N. end, is precipitated over cliffs forming two beautiful falls, the first 112 ft. high, and the second, $\frac{1}{2}$ m. farther on, 300 ft. high, and traverses the Grand Cañon, a gorge about 20 m. long, with a perpendicular height of 1,200 ft. To the S. and E. of the park is a timber preserve covering

nearly 2,000 sq. m., which was added in 1891. The region was partially explored in 1805; in 1809 it was surveyed, and two years later a thorough exploration was carried out. See Geyser.

Yellow Wood (*Zanthoxylum*). Genus of prickly shrubs and trees of the family Rutaceae. They are natives of tropical and sub-tropical regions. They have alternate leaves broken up into three or more leaflets. Small flowers are white or greenish, in clusters, and fruits are in most species aromatic, with a peppery pungency. The wood is yellow, and used for cabinet work, walking sticks, etc. *Z. americanum* is called the toothache tree from its fruits and bark being used as a remedy for that trouble. *Z. veneficum*, an Australian species, is so named because its bark contains a poisonous principle.

Yellow Wood. Alternative name for fustic, a yellow dyestuff, obtained from *Rhus cotinus* and *Morus tinctoria*. See Fustic.

Yembo, YANBO, OR YANBU. Seaport of the Hejaz, Arabia. On the Red Sea, it lies about 130 m. S.W. of Medina, of which it is the shipping centre, ranking commercially next after Jeddah. During the First Great War it was captured from the Turks in 1916 by the Hejaz army, in cooperation with the British fleet.

Yemen. Kingdom of Arabia. The Arabia Felix of the ancients, Yemen means "the land on the right hand" (of Syria). It lies in the S.W. corner of Arabia and is bounded W. by the Red Sea, N. by the Hejaz, E. by the Arabian Desert, and S. by Aden. The highlands and central plateau are the most fertile part of Arabia and produce extensive crops of wheat, barley, millet, coffee, and oats.

Until the First Great War, Yemen formed part of the Turkish empire and was divided into the vilayets of Hodeida, Sana, and Taiz. In 1918 Yemen was proclaimed an independent kingdom under an imam who was the head of the Zeidi sect of the Shiite branch of the Islamic faith. Soon after the setting up of the new kingdom, the imam of Yemen occupied the Tehama coast lands between S. Hodeida and Sheikh Said, together with the territory of the Shafai sect of Sunni Muslims bordering the Aden protectorate.

Between 1920 and 1928, Yemen made a number of encroachments on the Aden protectorate, to which the imam laid claim on historical grounds. The imam

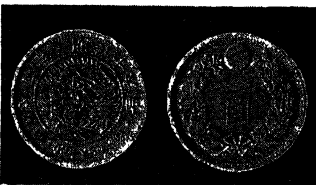
was eventually ejected from the Dhala district by British air action, and in 1934 withdrew from the protectorate territories as a condition of a treaty of friendship between Yemen and Great Britain. Italy had a major share in the development of Yemen and supplied the country with technical material and personnel. In 1937 Yemen and Italy signed a 25-year treaty of friendship, whereby Yemen recognized Italy's conquest of Abyssinia.

During the Second Great War, Yemen was benevolently neutral towards the Allies and enjoyed considerable prosperity supplying agricultural products to the Middle East armies. The kingdom was a constituent of the Arab League created on March 22, 1945, and was admitted a member of the United Nations in Aug. 1947. In 1946 she was granted a credit of £200,000 by the U.S.A. for the purchase of surplus stores in the Middle East.

On Feb. 17, 1948, the imam Yahya Muhammad Hamid Ud Din and three of his sons were assassinated at the instigation of Abdulla al Wazir, head of one of the leading families of Yemen. Abdulla al Wazir proclaimed himself imam but, unable to maintain his position, was executed by loyalist forces; Seif-el-Islam Ahmed, eldest son of Yahya, succeeding.

Yemen has an area of 74,000 sq. m. and an est. pop. of 3,500,000. Its trade, most of which passes through the port of Hodeida (pop. 30,000) to Massawa and Aden, thence to Europe, exceeds that of the remainder of Arabia. The principal export has been coffee, but the discovery of considerable oil deposits in 1947 seemed likely to alter that. The capital, Sana, has a pop. of 40,000. See Arabia.

Yen. Japanese monetary unit. It is coined in normal times in 5, 10, and 20 yen gold pieces. The



Yen. Both sides of the silver coin formerly current, half actual diameter

single yen is not coined, though a one-yen silver piece was formerly current. The yen is divided into 100 sen or 1,000 rin. When the gold standard was adopted, its nominal value was 2s. 0½d.

Yenangyaung. Town of Burma, on the Irawadi, 120 m. N.N.W. of Prome. It is the centre of the chief Burmese oilfield, to which it gives its name. Before the Second Great War, Yenangyaung wells produced 8,000 barrels daily, but destruction of installations by the British army during the Japanese advance reduced production to a maximum of 800 barrels daily throughout the Japanese occupation. Yenangyaung was recovered April 21, 1945, by the British 23rd corps in its advance down the Irawadi towards Rangoon, the whole oilfield being cleared by April 25. See Burma Campaign of 1941-45.

Yenikale, STRAIT OF. Alternative name for the Russian strait of Kerch (q.v.).

Yenisei. A river of central Siberia, R.S.F.S.R. One of the longest rivers in the world, it rises in the Tuva region, crosses Siberia from S. to N., and flows into the Arctic Ocean by the estuary formed by its mouth (Bay of Yenisei). It is at least 2,600 m. in length, and is navigable throughout most of its course during the summer. On or near the banks are Krasnoyarsk, Yeniseisk, and Turukhansk.

Yeol. Name of several English rivers. There are two in Somerset: one, also called the Ivel, rises in Dorset near Milborne Port, and flows 24 m. generally W. past Yeovil to join the Parret at Langport; the other, about 16 m. long, runs N.W. from near Harptree to Woodspring Bay in the Bristol Channel, 4 m. S.E. of Weston-super-Mare. The name is also given to streams near Exeter and near Barnstaple, Devon.

Yeola. Town of India, in Nasik dist., Bombay state. It is 13 m. S.S.E. of Manmad junction on the branch rly. line through Ahmadnagar. Silks, cottons, and gold and silver wire and thread are manufactured.

Yeoman. English word originally meaning a countryman, and later used for a class of those who cultivate the soil. In Chaucer the yeomen are retainers, but later appear to have become small freeholders, the intermediate class between the gentry and the labourers. The word was also used for farmers, those who rented land. In the 18th century the landholding yeomen declined in number. The older meaning of retainer still exists in yeoman of the guard, yeoman usher of the black rod, and other titles of officials of the royal household.

Yeomanry. Cavalry regiments of the British territorial army. They are so called because at their original formation they were recruited and commanded on a county basis, farmers and yeomen serving in the ranks and gentry as officers. All alike provided their own horses, uniform, accoutrements, and saddlery, the govt. issuing only swords and pistols. Officers and men were unpaid, except on embodiment, when they received army rates. Liability was for home service in the event of invasion or civil riot, but units could not be compelled to serve outside their own counties.

Although a few yeomanry troops were raised in 1761, they were not organized on a regimental basis until 1794, when Carnot was making preparations for a French invasion. In 1796 the Provisional Cavalry Act was passed whereby every owner of ten horses was required to find and equip one cavalryman for the militia. Six months later an amendment permitting the substitution of yeomanry for provisional cavalry in the county quotas stimulated the formation of voluntary units. At the close of the Napoleonic Wars the yeomanry had 44,000 officers and men, and the limitation as to place of service in Great Britain had been abolished. Failure by the French to stage a major invasion prevented all but one regt. from going on active service; the exception was the Pembroke Yeomanry, embodied to deal with a small raid on Fishguard in 1797.

All but some 50 yeomanry regts. were disbanded, and those that remained were seldom embodied except during the weavers' and Chartist riots. At the outbreak of the S. African War, strength had fallen to 10,000 officers and men. Of these, 3,000 volunteered to go to the Cape in newly-formed battalions of Imperial Yeomanry armed and organized as mounted infantry. They proved so useful in the war of movement against the Boers that further units were raised, and at the end of the war 32,000 men were on active service trained by original yeomanry regts.

In 1902 the Yeomanry was reorganized on the lines of the regular cavalry and its establishment was fixed at 55 regts., each of four squadrons. In 1907 all units were absorbed by the new Territorial force, regts. continuing to be administered on a county basis. In the First Great War the yeomanry mobilised; its first unit in action was the Oxfordshire Yeomanry,

which accompanied the R.N. div. to Antwerp. In 1915 four regts. were drafted to France and brigaded with regular cavalry, and nine were formed into an improvised dismounted force for Gallipoli. Only in Palestine was opportunity offered for the use of large horsed formations. Fourteen yeomanry regts. served with Allenby, and El Mughar, executed entirely by yeomanry, was the last great cavalry battle. In 1917, 18 regts. were dismounted to form the 74th infantry, the broken spur div., which served in Palestine, Macedonia, France, and Flanders.

When the Territorial force was reorganized as the Territorial army in 1921, only the 14 senior yeomanry regts. were retained as horsed units, the remaining 41 being converted into artillery bdes., armoured car cos., and engineer and signal units. At the outbreak of the Second Great War, most of them went to France with the B.E.F. The Lothians and Border Horse were attached to the 51st



Yeovil, Somerset. Parish church of St. John the Baptist

armoured div. and became the first British mechanised unit in action; retreating to St. Valéry, it formed the rearguard on the perimeter and was the last British unit fighting in 1940 in France. All horsed yeomanry regts. went to Palestine with the 1st cavalry div. and were mechanised, joining the 8th army in 1942, to serve throughout the N. Africa and Italy campaigns. The Wiltshire Yeomanry was first to break through at Alamain; a squadron of the Lothians and Border Horse was first into Tunis; and in Italy the Derbyshire Yeomanry was the first British unit to reach the Po. In 1947 all mechanised cavalry yeomanry units were affiliated to regular cavalry and Royal Tank corps regts. as part of the Royal Armoured corps. The North Somerset Yeomanry is the reconnaissance regt. of the 16th airborne div. (T.A.).

Yeomen of the Guard. Small military corps, officially styled the King's Body Guard of the Yeomen of the Guard. See Beefeater.

Yeomen of the Guard, THE, OR THE MERRYMAN AND HIS MAID. Comic opera in 2 acts by Gilbert, with music by Sullivan. It was produced Oct. 3, 1888, at the Savoy Theatre, London, where it ran for 423 performances. It is the only one of the Gilbert and Sullivan operas to have a "natural" as opposed to a fantastic plot; also the only one to end on a note of sadness. The setting is the Tower of London, the period is Tudor.

Yeovil. Mun. bor. and market town, giving its name to a co. constituency, of Somerset, England. On the Yeo, or Ivel, 127 m. W.S.W. of London, it is a rly junction. The chief building is the church of St. John the Baptist, a Perpendicular edifice with an old crypt. The town, noted for gloves, is also an agricultural centre. It became a borough in the 13th century, and its chief officer was

the port-reeve, until a new charter was granted in 1853. Important fairs were held here, and the glove making was introduced about 1560. Pop. (estimated) 19,000.

Yerkes, CHARLES TYSON (1837-1905). American financier, born at Philadelphia, June 25, 1837. His great

career as a financier began about 1873, and in a few years he had acquired a national reputation by his development of the street rly. system of Philadelphia. In 1881 he turned his attention to Chicago, where he ultimately controlled the street and elevated rly. In London at the beginning of the 20th century he greatly developed the tube systems. A philanthropist, Yerkes endowed the observatory named after him at Chicago university in 1892. He died Dec. 29, 1905.

Yermak (d. 1584). A Cossack chief. He flourished in the reign of Ivan the Terrible and conquered a large part of Siberia. At the instigation of Stroganov he crossed the Urals in 1580, routed Khan Kuchum, and seized his domains. Yermak was drowned in the Irtysh.

Yes-Tor. Mt. of Devon, England. On Dartmoor, 3 m. S. of Okehampton, it is 2,028 ft. high.

Yevpatoria. Crimean seaport better known outside Russia as Eupatoria (*q.v.*).

Yew (*Taxus*). Genus of evergreen trees, of the Coniferae family. The common yew (*T. baccata*) is a native of Great Britain, and other species have been introduced from America and Japan at various dates. They may be planted in any deep, rich, moist soil in shrubberies, on lawns, or with a view to forming hedges, but care should be taken with regard to position, as the foliage is poisonous to cattle. The yew is of very slow growth, and, while of stately spreading habit, rarely attains to a height of more than 40 ft. Some specimens are said to be over two thousand years old. The Irish yew is ornamental. See Botany; Conifer; Forestry; Topiary.



Yew. Foliage of the common yew, *Taxus baccata*

Yezd or **YAZD.** Town of Persia, capital of a prov. of the same name. It is about 170 m. E.S.E. of Ispahan, lies in a fertile oasis, and is to be served by rly. It manufactures silks, cotton, felt, and pottery. Yezd is the seat of the Guebers, who are Zoroastrians. Pop. 60,000. The prov., wedge-shaped, is bounded E. by Khorassan and Kerman, S. by Fars, N.W. by Ispahan and Samnan Damghan.

Yezidi or **YAZIDI.** Religious community of Iraq and the neighbouring Turkish Kurdistan and Armenia. Known as devil-worshippers, they number about 17,000. They speak a Kurdish dialect and are illiterate, but industrious, chaste, cleanly, and courteous. Based on the worship of good and evil, their religion may be a survival of Zoroastrianism, but has assimilated Christian, Muslim, and Magian customs; e.g. they both baptize and circumcise the males, and may take seven wives. Their chief ritual object is a peacock of yellow copper, carried once a year through the villages, all prostrating themselves. The devil, whose name is not pronounced, is venerated in the expectation of reward when he regains paradise. Priesthood is in six ranks, all inherited.

Yezo. Large island of Japan also known as Hokkaido (*q.v.*).

Yggdrasil. In Norse mythology, the world tree, also called Odin's ash, Odin's steed, and the gallows tree. Its branches spread above the heavens, and in them animals lived. See Jotun; Mimir.

Yiddish (Ger. *jüdisch*, Jewish). Name given to a dialect or dialects spoken by the Jews in various parts of the world. The Jews who migrated from Germany to the east of Europe in the 14th century took with them their mother-tongue. This, with an admixture of Hebrew and foreign words, gradually developed into a peculiar jargon. After the return to the west in the 17th century this jargon held its ground, and forms the basis of a popular dialect of German-Jewish in all parts of Europe and

also in America. It is estimated that 70 p.c. of the words in Yiddish are of German origin, 20 p.c. Hebrew, and 10 p.c. from other languages. Yiddish is much spoken in the East End of London, where newspapers are printed in it with Hebrew characters, and theatrical performances given. See Jews.

Yield Point and Stress. A phenomenon characteristic of some metals, notably mild steel, and shown up on the graph indicating strain variation with stress. At a certain point above the elastic limit a slight increment of stress gives rise to a sudden appreciable increase in strain. This point of sudden increase is the yield point and the corresponding stress the yield stress.

Ying Yang. In Chinese philosophy, the beginning of everything. From Tai-Cie are generated the two elements, Ying and Yang, which form the combination by which the formation of all material things is rendered possible. Ying means the female or the negative element, and Yang the male or positive element. In order to divide the Tai-Cie circle into Ying and Yang, so that the two elements would be equal to each other in magnitude, and that one would jut into the other to show their intimate relationship, a curved line is drawn in the circle. The symbol is widely used in China to mean good luck or prosperity. It is the emblem of Korea (*q.v.*).

Ymir. In Norse mythology, the hero of a crude cosmogonic myth. According to the Prose Edda he was a giant formed by the thawing ice of Ginnungagap, the yawning gap or primeval chaos. From his body were made the heavens and the earth.

Ymuiden or **IJMUIDEN.** Town of the Netherlands, in the prov. of

N. Holland. It is situated behind the dunes at the W. end of the North Sea Canal which connects it with Amsterdam, 15 m. to the E.S.E. Near are the locks which protect the canal when the tide is at the flood. Quays and other shipping facilities make the place a growing outport for Amsterdam. The fishery is valuable, and there are ice and chemical works. Pop., with Velsen, 46,004.

Yochow. Former treaty port of China, in Hunan prov. It is situated at the point where the Tung Ting Lake connects with the Yang-tse, and was opened to foreign trade in 1899. Pop. 25,612.

Yodel. Primitive form of song in Switzerland and is probably derived from the Ranz des Vaches, a melody played on the Alpen horn, for calling the cattle home. Yodelling is free in metre and rhythm and generally uses the restricted scale of the natural harmonics of such instruments as the Alpen horn.

Yoga (Skt., effort). One of the six orthodox systems of Hindu philosophy. It teaches the suppression of all fleshly desires and self-concentration to attain unity with God. Its followers (yogis) practise asceticism and various penances believed to confer supernatural powers. They worship Siva and their chief sanctuary is at Benares. F. Yeats-Brown's Bengal Lancer was a popular book about the dabbling of a Western mind in Yoga philosophy. Consult Yoga for You, C. Bragdon, 1948.

Yokohama. Principal seaport of Japan. It stands on the E. coast of Honshu Island, on Tokyo Bay, 15 m. S. by W. of Tokyo, with which it is connected by the oldest rly. line in the country. Yokohama superseded Kanagawa, which it includes, as a treaty port in 1859. Among its chief buildings were the custom house, court house, and prefectural offices. Its commodious harbour, protected by massive breakwaters, was well equipped. Silk was one of the chief articles of export, others being coal, copper, and tea. The principal imports were cotton and woollen goods, sugar, petroleum, and metal ware. Pop. (1940) 968,091.

In 1854 Commodore Perry landed here. The port grew as the foreshore was reclaimed from the sea; water-works were completed in 1887, and new harbour works in 1896. On Sept. 1, 1923, Yokohama was almost destroyed by an earthquake. An object of severe



Yokohama, Japan. General view of the seaport showing damage caused by air raids during the Second Great War

U.S. air attack during the Second Great War—3,200 tons of fire bombs were dropped on it in one day alone, May 28, 1945—Yokohama had more than 130,000 houses destroyed and some 700,000 homeless at the end of that war.

Yokosuka. One of the chief naval stations of Japan. It stands on the W. side of Tokyo Bay, on Honshu Island, 15 m. S. of Yokohama. Pop. 85,750.

Yola. One of the northern provs. of Nigeria. It is bounded E. by British and French Cameroons, and is traversed from E. to W. by the Benue river. Yola, the capital city, is situated on that river. Area, 11,600 sq. m.

Yom Kippur. Jewish day of atonement. The most solemn occasion in the year, it falls on the 10th day of Tishri, the first month of the ecclesiastical and seventh of the civil calendar. *See* Atonement, Day of.

Yonge, CHARLOTTE MARY (1823–1901). A British author. She was born Aug. 11, 1823,



Charlotte Yonge,
British author

at Otterbourne, Hants, where she lived all her life and died March 24, 1901. The inculcation of the High Church faith is the dominating note of her long series of novels, mostly historical, the first to achieve a striking success being *The Heir of Redclyffe*, 1853. Other well-known romances are *The Daisy Chain*, *Heartsease*, *The Dove in the Eagle's Nest* (placed in medieval Germany), *The Little Duke*. She wrote history of a simple character, including *Kings of England*, 1849; *Parallel History of France and England*, 1871; the deservedly popular *Book of Golden Deeds*, 1864; and the fascinating *History of Christian Names*, 1863.

Consult C. M. Y., G. Battiscombe, 5th. ed. 1945; Victorian Best-Seller, M. Mare and A. Percival, 1948. *Pron.* Yung.

Yonkers. City of New York, U.S.A., in Westchester co. A residential suburb of New York city, which it adjoins on the N., it is served by the New York Central and Hudson River rly. Settled in 1650, Yonkers was chartered as a city in 1872. There are rly. yards, and manufactures include headgear, carpets, wire, and patent medicines. Pop. 142,598, fourth biggest in the state.

Yonne. River of France, an affluent of the Seine. It rises in the heights of Morvan and flows generally N., across Nièvre and Yonne depts., for about 150 m. Its chief tributary is the Armançon. *See* Auxerre.

Yonne. Department of France. Formed of parts of the provs. of Champagne, Burgundy, and Orléanais, it lies adjacent to the depts. of Côte-d'Or, Nièvre, Loiret, Seine-et-Marne, and Aube. The surface is varied; in the N.E. lies part of the chalky Champagne Pouilleuse, S. of which lies the Forest of Othe; the Terre Plaine in the S.E. is a rich cereal-growing dist. The chief river is the Yonne, with its tributaries, the Cure, Serein, Ravillon, Vanne, etc. Mainly agricultural, the dept. produces wheat, oats, barley, etc., and the vineyards are rich and of good quality, Chablis being one of the wine centres. There are foundries, breweries, and quarries, and manufactures of leather, hosiery, tools, glass, and sugar. The capital is Auxerre. Area, 2,892 sq. m. Pop. 266,014.

Yorck von Wartenburg, HANS DAVID LUDWIG, COUNT (1759–1830). Prussian soldier. Born at Potsdam, Sept. 26, 1759, he entered the army as a boy, in 1779 was dismissed for disobedience, and served the Dutch in the East Indies. About 1786 he was reinstated

in the Prussian army, and in 1812 led the contingent sent to the Grand Army which invaded Russia. But Yorck hated the French alliance, and his influence led to the Tauroggen convention with the tsar and a declaration of war against Napoleon. Yorck led troops in the fighting of 1814, his greatest success being at Wartenburg. Made a count and a field-marshal, he died March 4, 1830.

Yoredale Series. Group of sedimentary rocks of lower Carboniferous age, found in N. and W. Yorks and Westmorland, England. They consist of a rhythmic succession of shale, sandstone, and limestone repeated several times. Hard beds form steep scarp slopes and hill spurs; in valleys they often form waterfalls. Yoredale is an alternative for Uredale, the valley of the Ure, but both names are less common than Wensleydale (*q.v.*) except in this geological context.

Yorick. In Shakespeare's *Hamlet* (Act. V, scene 1), the one-time jester whose skull Hamlet picks up in the grave-digging scene, saying, "Alas, poor Yorick! I knew him, Horatio; a fellow of infinite jest, of most excellent fancy." It has been hazarded that the passage contains a tribute to Richard Tarleton, the comedian (d. 1588). Sterne introduces himself with a sermon as Parson Yorick into *Tristram Shandy*; hence Yorick has become applied to that author.

York. City and mun. bor. and co. town of Yorks, England. It stands in the Ainsty between the



York arms

three Ridings, at the confluence of the Ouse and the Foss, 188 m. N.N.W. of London, and is served by main rlys. (*see* Points illus.) The industries include iron founding, rly. carriage building, printing, milling, making glass bottles, and cocoa and confectionery works. The Plantagenet walls, 3 m. in circuit, are pierced by four gateways or bars, and the city forms a perfect storehouse for the antiquary.

Its great glory, the massive and dignified minster, or cathedral church of S. Peter, seat of the second archbishop of the Church of England, was built on the site of a 7th century church, and has been several times damaged by fire. Famous especially for its stained glass and chapter house, the existing structure was begun in 1230

and includes examples of the E.E., Decorated, and Early and Late Perpendicular styles. On both sides of the beautiful W. façade rise two towers, 201 ft.; in the N.W. tower is hung the bell called Great Peter. The central tower or Great Lantern rises 216 ft. Total length, E. to W., 519 ft.; extreme breadth, 224 ft. The lofty choir is separated from the nave by a Late Gothic screen. There is a Late Norman crypt; in the chapter library are 8,000 books and numerous valuable MSS. Paulinus was the first bishop of York, 627-33; Egbert the first archbishop, 732-66.

There are many other churches of note, some with beautiful old glass. In the grounds of the Yorkshire Philosophical Society, 1822, are the ruins of S. Leonard's Hospital, 1260-80, the largest of its kind in medieval England; and those of the 11th century S. Mary's Abbey, a Benedictine foundation. Clifford's Tower (E.E.) overlooks the county assize court and the former prison, now a folk museum of unique character. Other features

of interest are remains of the Gothic guildhall, destroyed in a "Baedeker" raid, April 28, 1942; the ancient hall of the Merchant Adventurers, public library, three museums, S. William's College, Tudor manor house, S. Mary's convent, and endowed schools. There are narrow, crooked streets, like the Shambles, with gabled overhanging houses. The 17th century palace of the archbishop is at Bishopthorpe.

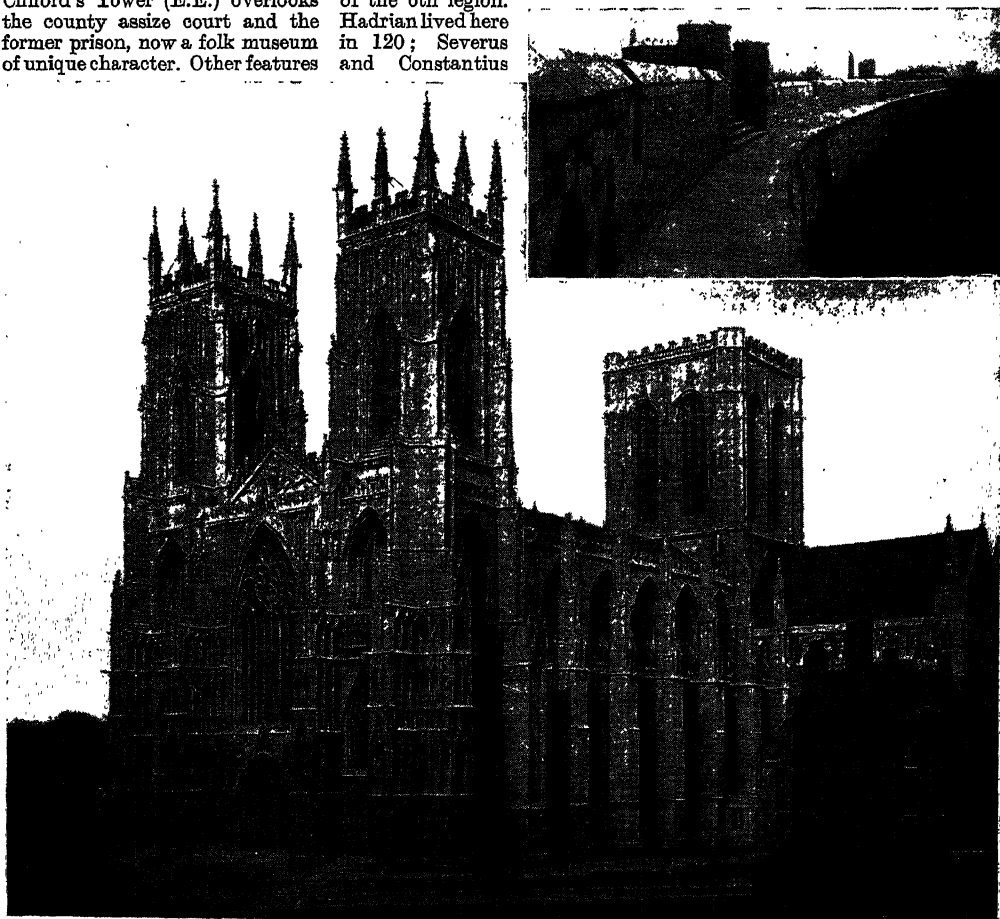
At Clementhorpe is a park of 20 acres, presented by Rowntree & Co., Ltd., in 1921 as a memorial to men of the firm who were disabled or killed in the First Great War. York races are held on the Knavesmire. Cattle and produce markets are municipal. One member is returned to parliament. The city is the h. q. of Northern Command.

The Eboracum of the Romans, York became the capital of the British province and headquarters of the 6th legion. Hadrian lived here in 120; Severus and Constantius

Chlorus died here. Parliaments were held at York in the reign of Henry II and later. William the Conqueror laid siege to the city and destroyed it; following a siege of more than a year, it capitulated to the parliamentarians after Mars-ton Moor. The title lord mayor of York dates from 1389. Market day, Sat. Pop. est. 105,970.

Bibliography. Histories and descriptions by F. Drake, 1736; W. Hargrove, 1818; J. Browne, 1838-47; G. A. Poole and J. W. Hugall, 1850; R. Davies, 1880; T. Widdrington, ed. C. Caine, 1897; M. Spence and M. E. Everatt, 1948.

York. City of Pennsylvania, U.S.A., the co. seat of York co. On Codorus Creek, 95 m. W. of Philadelphia, it is served by the Pennsylvania and other rlys. York is the centre of a rich agricultural region. It was laid out by Penn's surveyors in 1741, and a handsome Quaker meeting house of 1765 still



York. The cathedral or minster of S. Peter, which presents, especially in the west front here shown, one of the most perfect examples of Perpendicular architecture in England. Top, right, part of the old city walls

stands. York was the first lasting settlement in the state west of the Susquehanna. The continental congress made it the national capital for nine months in 1777-78. Incorporated in 1787, it became a city 100 years later. Foundry products, vehicles, bricks, furniture, clothing, and tobacco are made. Pop. 55,712.

York, HOUSE OF. Name given to the descendants of Edmund, (1341-1402), duke of York. They reigned in England, 1461-85, and on their behalf the Wars of the Roses were fought. In 1385 Richard II made his uncle, Edmund of Langley, duke of York. Edmund had two sons; the elder, Edward, succeeded to the title, but left no sons when he was killed leading the vanguard at Agincourt. The younger son, Richard, earl of Cambridge, had been executed for treason against Henry V in the same year, 1415. His son Richard succeeded to the dukedom.

But Richard was descended from Edward III not only through Edmund of York, his fifth son. Edward's third son, Lionel, duke of Clarence, left an only daughter Philippa, who married Edmund Mortimer, earl of March. Their granddaughter Anne was the wife of Richard of Cambridge and the mother of Richard of York. By the death of Anne's brother, Edmund, earl of March, without sons in 1425, Richard became, through his mother, the heir of Lionel of Clarence, through his father and uncle heir of Edmund of York.

After the death of Richard of York his sons, Edward IV and Richard III, represented the family. Richard was killed at Bosworth in 1485, after which his nephew Edward, earl of Warwick, son of George, duke of Clarence, was head of the Yorkists until he was executed in 1499. The house of York was represented thereafter only by females. One of these, Elizabeth, eldest daughter of Edward IV, was the wife of Henry VII, who thus claimed the estates of the dukedom of York. A sister of Edward IV, another Elizabeth, wife of John de la Pole, earl of Suffolk, left sons who gave trouble to the Tudors until the death of the last of them in 1525. A daughter of George of Clarence married Sir Richard Pole, and she too had several sons. See Lancaster; Roses, Wars of the.

York, FREDERICK AUGUSTUS, DUKE OF (1763-1827). British soldier. The second son of George III was born Aug. 16, 1763, and intended for the army. An income was

found by giving him as a baby the bishopric of Osnabrück. In 1784 he was made duke of York and Albany and a lieutenant-gen. In 1791 he married Frederica (1767-1820), daughter of the Prussian king Frederick William II.



Frederick Augustus,
Duke of York,
British soldier
After T. Phillips

In 1793 the duke was in command of a force sent to join the allied armies in invading France. Showing courage but no skill, he was easily beaten at Dunkirk and Tournai and in 1794 Pitt forced the king to recall him. In 1799 he took another force to the Netherlands. Field-marshal from 1795, York was made commander-in-chief in 1798, and did a good deal to improve the tone and discipline of the army. He was compelled to retire in 1809, as his mistress, Mary Ann Clarke, was charged with bribery, but was again commander-in-chief, 1811-27. He died Jan. 5, 1827. The "brave old duke of York" of nursery rhyme, he is commemorated by a column at the foot of Waterloo Place, London.

York, RICHARD, DUKE OF (1411-60). English nobleman. Born Sept. 21, 1411, he was the son of Richard, earl of Cambridge. His grandfather was Edmund, duke of York, son of Edward III, and when his uncle Edward was killed at Agincourt in 1415, Richard became the head of his branch of the royal family. In 1436 he was made lieutenant-general for Henry VI in France, and for some years was in charge of the warfare there.

In 1447 he succeeded Gloucester as chief opponent of the court party, and was sent to Ireland as lieutenant, but in 1450 he returned suddenly and led the opposition to Edmund Beaufort, duke of Somerset. It was suggested he should be declared heir, but instead he became protector for two brief periods. In 1455 the Wars of the Roses began, and at first York gained the upper hand; but by 1459 he was worsted and took refuge in Ireland. He returned to England and formally claimed the throne. His foes, however, caught



Richard Plantagenet,
Duke of York

him at Sandal Castle, near Wakefield, where during the battle he was killed, Dec. 30, 1460. York was one of the more statesmanlike warriors of his time, often trying to come to terms without the use of force. His wife was Cicely Neville, and his sons included Edward IV and Richard III.

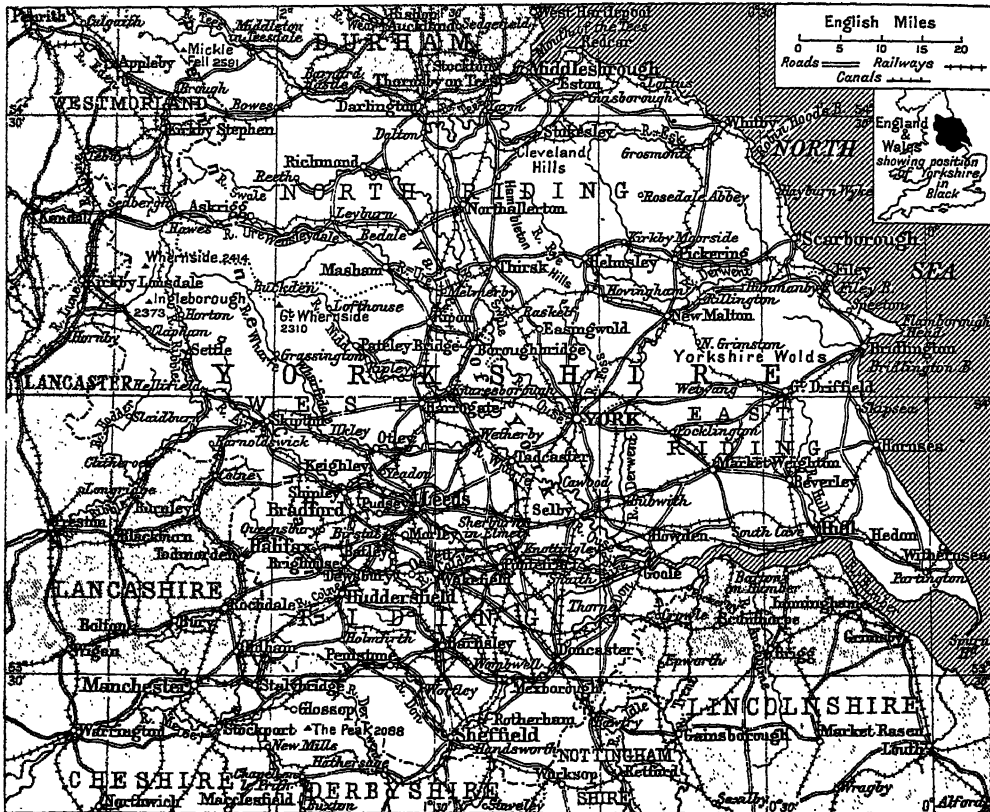
York, CARDINAL. For this Jacobite figure, see Stewart, Henry Benedict.

York and Lancaster Regiment. Unit of the British army. It was formed in 1881 by the amalgamation of the 65th (North Riding) Foot and the 84th (York and Lancaster) Foot. Raised in Suffolk, 1756, as a second bn. of the 12th Foot for service in the Seven Years War, the 65th Foot became a separate regt. in 1758. It first saw service when it took part in the capture of Guadeloupe, 1759, and provided detachments for forces sent to seize Martinique and Cuba. After a period of home service the 65th again crossed the Atlantic and served throughout the American War of Independence, earning particular distinction at Bunker Hill. In 1782 it took the territorial designation 2nd York-shire North Riding regt. In 1793-94 the 65th took part in the capture of Martinique and Sta. Lucia. After being in India for the second Mahratta War, in 1810 it helped to seize Mauritius from the French. Then followed service in the Mahratta and Pindari Wars. In 1819 the 65th were in action against Arab pirates in the Persian Gulf, and in 1846 went to New Zealand, remaining there until the end of the Maori Wars in 1865. In 1881 it became the 1st bn. of the York and Lancaster regt.

Raised in 1759 for service in India, the 84th Foot took part in the Mysore War and was disbanded in 1763. In 1775 it was formed again in Canada from Scottish settlers. It served throughout the American War of Independence as the Royal Highland Emigrant killed regt., and was again disbanded. Again formed in 1793, it went on active service in the Netherlands; in 1796 to the Cape; and in 1798 to Goa. In 1802 it was converted to marines for service in Indian waters, and in 1810 it joined the 65th Foot in the Mauritius expedition. Thence it moved to the Peninsula. During 1842-54 the regt. was in Burma, and it assisted in quelling



York and Lancaster
Regiment badge



Yorkshire. Map of the largest English county, whose "broad acres" include mountains, moorlands, beautiful dales, rolling wolds, and rich pasture lands, as well as a great coalfield and many famous centres of manufacturing industry.

the Indian Mutiny; one co. was massacred at Cawnpore, and the rest were at the relief of Lucknow.

The York and Lancaster regt. fought in the Sudan, 1884, and the S. African War. Twenty-two bns. were raised for the First Great War and gained the honours: Ypres 1915, '17, '18; Somme, 1916, '18; Messines, 1917, '18; Passchendaele; Cambrai, 1917, '18; Lys; Selle; Piave; Macedonia, 1915-18; Gallipoli, 1915. Service in the Second Great War included the campaigns in France, 1940; N. Africa; Crete; Sicily; Italy; Burma. The regimental depot is at Pontefract.

York House. Royal residence in London. Part of St. James's Palace (*q.v.*), so named since it was the residence of George V when duke of York, it became the home of his son, later Edward VIII. Lancaster House (*q.v.*) was first called York House.

Yorkshire. Largest co. of England. Its area is 6,077 sq. m., greatest length 89 m., greatest breadth 100 m. It is divided into ridings (*q.v.*), North R. (2,128 sq.

m.), West R. (2,775 sq. m.), and East R. (1,172 sq. m.), each with its separate council administration, the capitals of the three ridings being respectively Northallerton, Wakefield, and Beverley. At the junction of the ridings is the "Ainsty" of York (6 sq. m.), the county town. To the W. of the co. the greater part of the Pennine Chain, "the backbone of England," runs from N. to S. (Mickle Fell, 2,591 ft.). The co. is bounded E. by the North Sea, between the estuaries of Tees and Humber, the coastline being generally high and rocky from the Tees southward to Flamborough Head, thence to Spurn Point low and unrelieved. Inland to the N.E. is the moorland district of Cleveland and the Hambleton Hills, and in the E. the chalky Yorkshire Wolds. Eastward from the Pennines run famous and beautiful dales, Swaledale, Wensleydale, Nidderdale, Wharfedale, Airedale, etc. In the centre is the flat vale, or plain, of York.

Yorkshire is mainly drained by the Ouse and its tributaries Swale, Ure, Wharfe, Nidd, Aire, Don

(which rise in the Pennines), and Derwent, which rises in the N.E. hills. The Ouse flows into the North Sea by the Humber estuary. The Ribbles also rises in the Pennines, but soon flows W. into Lancashire. The Tees flows to the North Sea in the N., and in the N.E. a short river, the Esk, rises in the moors and has its own minor estuary at Whitby.

Coal is the most important mineral product, the coalfield covering most of the S.W. of the county, now largely industrialised, with the cities of Sheffield and Leeds as great industrial and commercial centres, and busy, if unbeautiful, towns such as Barnsley, Rotherham, and Dewsbury. Iron ore as well as coal is worked in Cleveland, with Middlesbrough the centre of the industry as well as its seaport. Limestone and sandstone are important. Bradford (another city) and Huddersfield are leading centres of woollen manufacture, which engages a large part of the W. Riding.

On the other hand, the N. and E. Ridings are mainly agricultural.

Sheep farming and horse breeding are leading activities, and there are extensive cereal crops. Yorkshire hams have been famous, as is Wensleydale cheese. York and Ripon are cathedral cities. Popular holiday towns on the coast are (N. to S.) Redcar, Saltburn, Whitby, Scarborough, Filey, Bridlington, and Hornsea, and there are also the picturesque fishing villages of Staithes, Runswick, and Robin Hood's Bay, as well as smaller resorts. Harrogate is an inland spa. Doncaster is famous for its rly. works and its racecourse. The county is well served by rlys., and the Great North Road runs through it from Bawtry in the S. to Darlington, just across the Durham border in the N. There are many ancient castles, as well as such great estates as Harewood, Castle Howard, Bolton, Wentworth Woodhouse, Farnley, Garrowby. Among numerous beautiful abbey ruins are those of Fountains, Kirkstall, Jervaulx, Rievaulx, Bolton, Whitby, and Byland. Excluding boroughs, Yorkshire returns 20 M.P.s. Pop.: W. Riding, 3,352,555; N. Riding, 469,375; E. Riding, 482,936.

LITERARY ASSOCIATIONS, ETC. The name of Caedmon, first English poet, is closely linked with Whitby Abbey, as is that of the Venerable Bede. Wycliffe was born at Hipswell, near Richmond, and Coverdale is said to have taken his name therefrom. Ascham was born at Kirkby Wiske. Sterne, who held the livings of Sutton (near York), Stillington, and Coxwold, drew upon local characters for the persons in *Tristram Shandy*, which he wrote at Coxwold. Sydney Smith was for 20 years rector of Foston. At Haworth is the parsonage where the Brontë sisters lived; they were born at Thornton, near Bradford. Scott wrote of Jervaulx in *Ivanhoe*, of Whitby in *Marmion*, and of the Barnard Castle dist. in *Rokeby*. In the last district also Dickens placed his villainous schoolmaster Squeers. Wordsworth found inspiration in the county for *Hartleap Well*, *The White Doe of Rylstone*, etc. Lytton wrote of Knaresborough in *Eugene Aram* and of Middleham in *The Last of the Barons*. Mrs. Gaskell set scenes of *Sylvia's Lovers* at Whitby, and the same place figures in Bram Stoker's sensational romance, *Dracula*. Mary Linskill was a once-popular novelist who in *The Haven Under the Hill* and other works also wrote much of Whitby, where she lived and died. The many later writers

who have drawn fully on Yorkshire scenes and characters include J. B. Priestley (a native of Bradford), Phyllis Bentley (a native of Halifax), and Leo Walmsley, who wrote of the Robin Hood's Bay district. Humbert Wolfe was educated at Bradford. *The Victoria History of the co.* appeared in 3 vols., 1907-14.

Turner, while visiting Farnley Hall, found inspiration in Wharfedale for some of his finest watercolours. Yorkshire itself has produced outstanding artists, among them Etty, Sir William Rothenstein, R. V. Pitchforth, and Raymond Coxon, and the sculptors Henry Moore and Percy Metcalfe. George Du Maurier had a house at Whitby and often used local scenes in his Punch drawings. Delius was a Bradford man.

Yorks is famous for its choral singing, the Sheffield choir having enjoyed a world reputation. Nor must mention be omitted of Yorkshire county cricket, which has for so long played a dominating part. The team won the county championship 22 times between its inauguration in 1873 and 1946, and shared it in 1949: a record unapproached by any other county. The names of Lord Hawke, F. S. Jackson, Hirst, Rhodes, Sutcliffe, Kilner, Leyland, Verity, Bowes, Norman Yardley, and Hutton are commanding ones in the story of international cricket over 50 years.

Yorkshire Light Infantry, KING'S OWN. Regiment of the British army. Raised in Yorkshire in 1755 as the 51st Foot, it first saw active service in Flanders, and was one of six British infantry units at



Yorkshire Light Infantry badge

Minden in 1759. It served in the American War of Independence and at Martinique and the Cape of Good Hope. In 1805 it was converted into light infantry, and was with Moore at Coruña, and later a unit of Picton's Light div., with which it fought in the Peninsula, gaining distinction at Salamanca, Vitoria, and Badajoz. It was on the field of Waterloo. The 51st spent most of the 19th century in India, taking part in the Afghan Wars and operations on the N.W. Frontier.

In 1881 the 51st adopted its present territorial designation and absorbed as its 2nd bn. the 105th Foot. This had been raised by the E. India co. in 1839 as Madras light infantry, and after the Indian

Mutiny came on to the British establishment. Both bns. of the K.O.Y.L.I. were in the S. African War, being prominent at the Modder River. Twenty-six battalions were raised for the First Great War and earned the honours: Le Cateau; Marne, 1914, '18; Mesines, 1914, '17, '18; Ypres, 1914, '15, '17, '18; Somme, 1916, '18; Cambrai, 1917, '18; Havrincourt; Sambre; Italy, 1917-18; Macedonia, 1915-17. In the Second Great War, bns. went to France, 1940; N. Africa; Italy; Burma; N.W. Europe. The regimental depot is at Pontefract.

Yorkshire Penny Bank. Established in 1859 and registered under its present title as a limited company in 1911. This concern was primarily intended for small investors and conducted a substantial business among children by schools savings accounts. As business developed, full banking facilities were provided. The large banks are believed to be the principal shareholders. Branches are established in many towns and villages in the North and Midlands, and a London office in Cheapside.

Yorkshire Post, THE. English daily newspaper, published in Leeds. It appeared first as a weekly, *The Leeds Intelligencer*, July 2, 1754. This became a daily, July 2, 1866, as the *Yorkshire Post and Leeds Intelligencer*, the name of the *Intelligencer* being dropped in 1883. In 1939 the paper absorbed an even older journal, the *Leeds Mercury* (established 1718), for long a formidable rival, though the *Yorkshire Post* had owned the paper for some years before the amalgamation. The price of the *Yorkshire Post* was at the same time reduced from 2d. to 1d. It is owned by the *Yorkshire Conservative Newspaper co.*, and in 1947 had the third largest circulation among provincial morning dailies. Anthony Eden was at one time on the staff. *The Yorkshire Evening Post* (1890) is issued at 1½d. by the same firm.

Yorkshire Regiment. Unit of the British army. Its official title since 1920 has been *The Green Howards (Alexandra, Princess of Wales's Own Yorkshire Regiment)*. See *Green Howards*.

Yorkshire Terrier. Small breed of dog descended from the Scotch terrier, but with longer and more silky hair. Similar in general shape to the smooth terrier, the body is longer and the limbs much shorter. The coat is of three colours—the back being slate-blue, the head and

legs silvery fawn, and the underparts tan. *See* Dog colour plate.

Yorkton. Town of Saskatchewan, Canada. It lies 130 m. N.E. of Regina, on the C.P.R. and C.N.R. The centre of a large livestock and grain-growing district, it has three elevators, a flour mill, machine shops, lumber yards, and an oil refinery. Pop. 5,517.

Yorktown. Town of Virginia, U.S.A., the co. seat of York co. It stands on York river, 65 m. S.E. of Richmond. Yorktown has twice been besieged. In 1781, during the American War of Independence, Cornwallis had withdrawn into it his whole force, consisting of about 7,200 men; investment by 16,000 Americans and French began on Oct. 5, and Cornwallis surrendered on Oct. 19. The second siege occurred in 1862, during the American Civil War, when the Confederates held the town from April 4 to May 3. Yorktown has the oldest customs house in the U.S.A. Pop. 521. *See* American Independence illus. p. 379.

Yoruba. Negro people living mostly in S. Nigeria. Estimated at 2,000,000, they attained under Libyan infiltration an advanced culture. Yorubaland, embracing 28,000 sq. m., lies between Benin and the Badagry river.

Yosemite Valley. Gorge in Mariposa co., California, U.S.A. It is situated at the S.W. base of the Sierra Nevada. Remarkable for its wildly picturesque scenery, it is between 7 and 8 m. long, from $\frac{1}{2}$ m. to rather more than 1 m. in breadth, and nearly 1 m. below the level of the neighbouring country. Mainly level, it is enclosed on three sides by almost vertical walls of granite. The Merced river, which traverses the valley, forms with its affluents a number of magnificent waterfalls. The most majestic of these are the Yosemite Falls, a succession of three, with a total descent of 2,500 ft. The valley forms part of the Yosemite national park, covering over 1,500 sq. m. *Pron.* Yo-sem-mity.

Yoshihito (1879-1926). Em-



Yoshihito,
Emperor of Japan

peror of Japan. Born Aug. 31, 1879, in Tokyo, a younger son of the emperor Mutsuhito, he became heir apparent at the age of eight, elder brothers having died. In 1900 he married Princess Sadako,

and in 1912 came to the throne. He was much handicapped by ill-health, and from 1921 his son Hirohito (*q.v.*) acted as regent. Yoshihito died Dec. 25, 1926. His reign was called the era of righteousness (Taisho).

Yoshkar-Ola. Chief town of Cheremisa or Mari, an autonomous republic of the R.S.F.S.R. It is a rly. terminus, about 80 m. N.W. of Kazan. The people are of Cheremiss (*q.v.*) stock.

Youghal. Seaport and market town of Cork, Eire. It stands on the estuary of the Blackwater, 27 m. E. of Cork on the state rlys. The collegiate church of S. Mary dates from the 13th century. The town has a good harbour and trades chiefly in agricultural products. It is a centre for salmon fishing in the Blackwater. Pottery, silk, and lace are made. Norsemen settled at Youghal, which was given a charter in 1209. Raleigh as mayor, 1588-89, here introduced potatoes and tobacco to the British Isles. Pop. 4,803. *Pron.* Yawl.

Youmans, VINCENT (1898-1946). American composer. A New Yorker, born Sept. 27, 1898, he provided the score for several musical comedies, beginning in 1921. Best known in England were *No, No, Nanette* (1924) and *Hit the Deck* (1929). The film music for *Great Day* was also by Youmans, and his most characteristic song was perhaps *Time on my Hands*. By 1930 he was one of the leaders in American light music, but he contracted tuberculosis and virtually stopped composing. He died April 5, 1946.

You Never Can Tell. Comedy by Bernard Shaw. This hilarious piece, with its brilliantly effective first act set in a dentist's work-room, was included in the volume, *Plays Pleasant and Unpleasant*, and was first produced for the Stage society at the Royalty Theatre, London, Nov. 26, 1899. It ran at the Strand, 1900, and has had frequent revivals, *e.g.* Westminster Theatre, 1938; Wyndham's Theatre, 1947.

Young, ARTHUR (1741-1820). British writer. A Londoner, born Sept. 11, 1741, he was brought up at Bradfield Hall, in Suffolk. He wrote works on agriculture based on his own experiences and on observations made on journeys through England, Ireland, and France, writings which gave a great impetus to scientific agriculture in England. His works include *A Tour Through the Southern Counties*, 1768; *A Tour*

Through the North of England, 1771; *A Tour in Ireland*, 1780. His *Travels in France* became specially of value for historians because Young was there before and early in the Revolution. In 1793 he became first secretary to the board of agriculture. He died April 20, 1820.

Young, BRIGHAM (1801-77). American religious leader. Born at Whitingham, Vermont, June 1, 1801, he entered the Mormon Church in 1832, and was chosen president in 1844. He had already set up branches in England. By skill and perseverance he established his people at Salt Lake City in 1847, and two years later

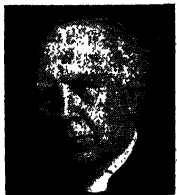


Brigham Young,
Mormon leader

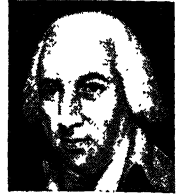
became governor of the territory of Utah. In this position Young misused power, so that federal troops were sent against him and he was obliged to resign in 1858. He had in 1852 published the Mormon doctrine of polygamy, "revealed" to Joseph Smith ten years earlier, and enjoined its practice on all his followers, himself marrying over 20 wives and becoming the father of 57 children. An organizer of genius, he started industries, a cooperative society, university, temple, and theatre. He died Aug. 29, 1877. *See* Mormons; Salt Lake City; Utah. *Consult* *Story of the Mormons*, W. A. Linn, 1902; *Life*, S. Y. Gates, 1930.

Young, DINSDALE THOMAS (1861-1938). English preacher. Born at Corbridge-on-Tyne, Nov.

20, 1861, he began to train for the Wesleyan ministry at Headingley theological college in 1879, the youngest candidate accepted up to that time. His first pastoral charge, 1883-87, was at Hornsey, London; he moved subsequently, in accordance with the Wesleyan system, from one charge to another, building up a reputation as an eloquent and persuasive preacher.



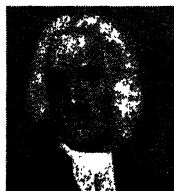
Dinsdale Young,
English preacher



Arthur Young,
British writer
After J. Rising

He was minister of Wesley's Chapel, City Road, London, 1906-14, and was then appointed to the new Central Hall, Westminster, where Sunday after Sunday he preached to congregations of more than 2,500, remaining there until his death, Jan. 21, 1938. President of the Wesleyan conference in 1914, he published a number of books on devotional subjects, and an autobiography, *Stars of Retrospect*.

Young, EDWARD (1685-1765). An English poet. He went from Upham, Hants, to be educated at



Edward Young,
English poet

Winchester and Corpus Christi College, Oxford. A royal chaplain, in 1730 he was given the living of Welwyn, which he held until his death on April 5, 1765. In addition to several tragedies, Young wrote much pedestrian verse. His only poem of permanent value is *The Complaint, or Night Thoughts on Life, Death, and Immortality*, in blank verse, 1742, which achieved an extraordinary success and has been widely quoted and translated; e.g., from it comes "Procrastination is the thief of time."

Young, FRANCIS BRETT (b. 1884). English novelist. Born at Halesowen, Worcs, he was educated at Epsom College and Birmingham university, qualifying in medicine. His first book, 1913, was a study of the poetry of Bridges. Experiences in Africa during



Francis Brett Young,
English novelist

the First Great War, when he was a major in the R.A.M.C., provided the inspiration for *Marching on Tanga*, 1918. But Brett Young made more stir as a novelist of the Welsh borderlands, producing realistic stories such as *The Young Physician*, 1919; *Portrait of Clare*, 1927 (James Tait Black prize); *My Brother Jonathan*, 1928, and *A Man About the House*, 1942 (both filmed). *Cold Harbour*, 1924, was a brilliant study in the macabre. *They Seek a Country*, 1937, and *The City of Gold*, 1939, were pictures of the African gold rush.

Young, GLADYS. British radio actress. She was born in New-castle, but moved as a child to



Gladys Young,
British radio actress

Sutton, Surrey, where later she was interested in amateur acting. She then studied at the R.A.D.A., where she was the first pupil to win the Forbes-Robertson silver medal. During 1914-16 she was leading lady to Dennis Eadie, but then left the stage on her marriage to Algernon West. She first broadcast with the B.B.C. in 1926, and was soon a leading radio actress. She became one of the members of the B.B.C. drama repertory company on its formation in 1939, remaining with it until 1950. The acknowledged head of her particular profession, and sympathetic interpreter, by voice alone, of almost every type of feminine character, she probably took more parts in radio plays than any other individual. Her first film appearance was in *The Courtenays of Curzon Street*, 1947. Her sister was Emily Hilda Young, novelist, whose book, *Miss Mole* (1930), was awarded the James Tait Black memorial prize.

Young, JAMES (1811-83). British chemist. Born in Glasgow, July 13, 1811, he studied chemistry and physics in the Andersonian university and at University College, London. On the discovery of a spring of petroleum at Alfreton, Derbyshire, in 1847, he set about developing the industry of illuminating and lubricating oils. He established works for the distillation of coal or shale at Bathgate and Addiewell, and paraffin was one of the by-products of his process. He died May 14, 1883.

Young, OWEN D. (b. 1874). American lawyer. He was born at Van Homesville, N.Y., Oct. 27, 1874, and educated at St. Lawrence university and Boston university law school, lecturing at the latter during 1896-1903. After acting as counsel for the General Electric co., he joined the board, and became chairman in 1923. Wilson and Harding both employed Young as an adviser on business matters, and in 1929 he became chairman of a committee appointed to draw up a new scheme for German reparations. Thus was produced the *Young Plan* (q.v.). Young later presided over a committee for unemploy-

ment relief set up by Hoover, and continued to carry on business activities. A *Life* by I. M. Tarbell appeared in 1932.

Young, THOMAS (1773-1829). British physicist and Egyptologist. Born at Milverton, June 13, 1773, he early took an interest in science and languages. He took his degree in medicine at Göttingen, and in 1801 was appointed professor of natural philosophy at the Royal Institution. Young made his reputation by his researches on optics. He was the first to prove that the accommodating power of the eye is due to variation in curvature of the lens, and to give an explanation of colour sensation. He measured astigmatism, explained capillary phenomena, did work on the wave theory of light, and gave his name to Young's Modulus (q.v.) of elasticity. As an Egyptologist his great service was translating in 1814 the demotic text of the Rosetta stone. Young died May 10, 1829. There are *Lives* by G. Peacock, 1855; F. Oldham, 1933.



Thomas Young,
British physicist
After Sir F. Lawrence

Young England. Name given to an English political group that appeared about 1842-46. Its members were young Tories who in many ways disliked the policy of the party leader, Peel. Drawn chiefly from the aristocracy, Lord John Manners, afterwards 7th duke of Rutland, being one of them, the members advocated friendlier relations between rich and poor. Disraeli belonged to the group, whose ideas he described in *Sybil*, or *The Two Nations*, 1845.

Younger, GEORGE YOUNGER, 1st Viscount (1851-1929). British politician, born Oct. 13, 1851. In youth he entered the family brewing business. In 1906 he became M.P. for Ayr Burghs. An able speaker on Scottish matters and a powerful organizer, he was president of the national union of Conservative associations in Scotland, 1914. As chairman from 1916 of the Unionist party organization, he was a principal architect of the coalition victory in 1918. In 1922 his name became prominent in the internal dissensions of his party, and Younger resigned his post. Created a baronet in 1911, and made viscount in 1923, he died April 29, 1929. In 1946 Edward

George Younger (b. Nov. 21, 1906) became 3rd viscount.

Younghusband, Sir Francis Edward (1863-1942). British soldier and traveller. Born at Murree, India, May 31, 1863, he joined the 1st Dragoon Guards in 1882. In 1890 he was transferred to the Indian service, and he became British commissioner to Tibet, 1902-04, and resident in Kashmir, 1906-09. His journeys of exploration and survey included one from Peking to India through Chinese Turkestan in 1887. Among his publications were *The Heart of a Continent*, 1898; *India and Tibet*, 1912; and (with his brother, G. J.) *The Relief of Chitral*, 1898. Sir Francis, knighted in 1904, died July 31, 1942.

Young Ireland Party. Name given to a group of men formed in Ireland in 1848 to unite all Irishmen irrespective of creed in an effort to secure the complete independence of the country from England. Among its leaders were Gavan Duffy and Smith O'Brien. The policy of violence led to a number of the leaders being transported or compelled to leave Ireland. See *Ireland: History*.

Young Men's Christian Association. International organization for promoting the spiritual,



Y.M.C.A.
badge

social, physical, and educational welfare of young men. In its present form it was founded by Sir George Williams (q.v.) in 1844. When a young man employed in a warehouse in St. Paul's Churchyard, London, he got together a band of young shop assistants for Christian fellowship and mutual improvement, and out of this has grown the worldwide organization briefly known as the Y.M.C.A. Its work was originally confined to young men attached to business houses who were either living in or in lodgings. The movement spread rapidly, and associations, as they were called, were formed all over the country, as well as on the Continent. In 1851 one was started in America, in 1853 in Australia, New Zealand, and South Africa, and in 1854 an alliance of associations of the U.S.A. and Canada was established. The international movement really dates from 1855, when the first world conference was held in Paris.

During both Great Wars the British Y.M.C.A. rendered invaluable service by its welfare work at home and in the battle areas. It organized huts and canteens for war workers and soldiers in camp



Young Men's Christian Association.
National h.q. for the British Isles,
at the corner of Tottenham Court
Road, and Gt. Russell St., London

and billets; it arranged concerts and lectures. The national headquarters are at 112, Great Russell Street, London, W.C.1

Young Plan. Scheme for German reparations payment, drawn up in 1929, to replace the Dawes Plan (q.v.). It reduced the annuities payable, limited the number of yearly payments to 59, and created the bank of international settlements at Basel to handle all reparations transactions. The world depression made it impossible for Germany to continue even these reduced payments, and in 1931 the Hoover (q.v.) moratorium—intended as a temporary measure—suspended them. No further attempt to collect reparations had been made when the Second Great War started.

Young's Modulus of ELASTICITY. Term given in engineering to the constant which governs the relationship between stress and strain of an elastic material within its range of elasticity. The modulus is found by dividing a stress by its corresponding strain; its units are the same as those of the stress, since the strain is only a number. The value of the modulus of direct elasticity for mild steel is 30,000,000 lb. per sq. in., and for transverse elasticity 12,000,000 lb. per sq. in. Young's modulus for rubber is not a constant, for strain and stress do not vary in direct proportion.

Youngstown. Industrial city of Ohio, U.S.A., the co. seat of Mahoning co. It stands on Ma-

honing river, 64 m. E.S.E. of Cleveland, and is served by the Baltimore and Ohio and other rlys. Settled in 1796, Youngstown was incorporated in 1848. In a region rich in minerals, it turns out a sixth of the pig iron and an eighth of the steel of the U.S.A. There are 4 sq. m. of public parks. Pop. 187,720.

Young Turks. Turkish political organization. The outcome of a movement whose ostensible object was the re-establishment of the constitution granted by the sultan Abdul Hamid in 1876, it really aimed at resuscitation of the Turkish empire and complete Turkification of its peoples. A secret committee of union and progress was formed at Salonica in 1905, and included Enver Pasha (q.v.), who headed a revolution which broke out at Resna, July 3, 1908. Monastir (Bitolj) was captured and the sultan dethroned. In general administration the Young Turk committee showed itself more oppressive and tyrannous than Abdul Hamid had been. It drove Turkey into the First Great War on the side of Germany. In 1918 the leaders fled. See *Turkey: History*.

Young Women's Christian Association. International organization for the spiritual, social, physical, and educational welfare of young women. Known briefly as the Y.W.C.A., it does what the corresponding Y.M.C.A. does for young men. It was founded in 1857 in Great Britain and the following year in America. Like the Y.M.C.A. it organizes hostels and clubs in nearly every country of the world and during both Great Wars looked after the welfare of women in the services and industry. The British headquarters are in Great Russell Street, London, W.C.1.

Youth Hostels Association. Name of three British wayfaring organizations; the Y.H.A. of England and Wales, the Y.H.A. (Scottish), and the Y.H.A. of N. Ireland. Based on the early 20th century German Wandervogel, which in turn was derived from the bands of artisans and minstrels who travelled through medieval Germany, the British Youth Hostels Associations were founded in 1930. They help people, particularly young persons of limited means, to a greater appreciation and care of the countryside; encourage walking and cycling holidays; and provide hostels and other simple accommodation for travellers. Hostels are main-

tained throughout the U.K., each under control of a warden. Accommodation includes separate dormitories for men and women, with bed, pillow, and blankets, washing and cooking facilities, and a common room. The standard overnight charge is 1s. 6d., or 9d. for those under 16. Some hostels rank as catering establishments. Use of hostels is restricted to members of the associations, which charge a subscription ranging from 1s. to 7s. per annum according to age, or a life subscription of £4 4s. The British associations belong to the International Youth Hostels Federation.

Youth Service. Branch of the educational system of the U.K. It is concerned with the leisure of young people between 15 and 20 who are no longer in full time attendance at school. It developed

out of the work of such voluntary organizations as the Church Lads' brigade, boy scouts, and girl guides. In 1939 the board of Education was given the special responsibility of looking after the needs and interests of young workers, the minister being authorised to make grants to voluntary youth organizations.

The Education Act, 1944, placed upon every local education authority the duty of providing facilities for leisure time occupation for those over compulsory school age. It was expected that youth activities would be associated closely with county colleges when those were established; meanwhile they were related principally to evening institutes, religious organizations, and boys' and girls' and mixed clubs. Almost every educational authority has a youth officer. Local education authorities may make grants, while the ministry of Education assists financially



Ypres, Belgium. Arch of the Menin Gate erected in 1927 as a memorial to British soldiers

national bodies that cooperate. Consult Purpose and Content of the Youth Service, H.M.S.O., 1945.

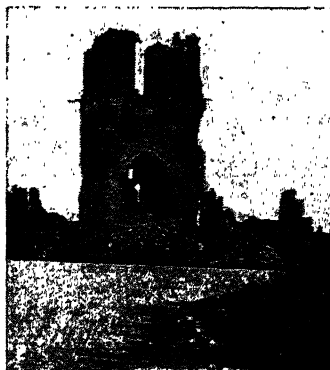
Ypres (Flem. Yperen; Ger. Ypern). French and most familiar name of a town of Belgium, in the prov. of West Flanders, on the Yperlee and the Ypres canal, 28 m. S. of Ostend; in the Middle Ages, together with Ghent and Bruges, one of the most



Ypres arms

important and prosperous trading cities of Flanders, and an international centre of cloth making and trade, with a reputed 14th cent. pop. of 200,000. Its beautiful Gothic buildings reflected this lost glory: the Cloth Hall, with a frontage of over 150 yards, built 1201-1304; the adjoining Meat Hall, 13th century; the belfry, same period; two hospitals of 1261 and 1279; and the cathedral of S. Martin, a remarkable building of 1221-66, with three naves, an unfinished tower, and the tomb of Jansen; also numerous private dwellings of Gothic and Renaissance style stretching from the large central square, the Groote Markt.

Assailed by the Germans in Oct. 1914, this town was almost com-



Ypres, Belgium. 1. The 13th century Cloth Hall in the Grand Place, the finest Gothic public building in the country, as it stood before the First Great War. 2. The shattered belfry standing among the ruins after the German bombardment. 3. The Cloth Hall partially restored, showing part of the ruins in the centre, and the cathedral on the right

pletely destroyed by shell-fire during the First Great War. Its post-war construction closely followed the old pattern, even in domestic buildings, though the ruins of the original Cloth Hall were preserved as a memorial. At the Menin Gate (Porte de Menin), on the Menin road leading W. from the town, a great arch was erected 1927 as a memorial to missing British soldiers. The town is also surrounded by 40 British war cemeteries.

Taking part in Philip van Artevelde's revolt against the

count of Flanders in the 14th cent., Ypres was taken by the French in 1382, and again besieged in 1383 by Ghent and English forces. It was frequently assaulted and conquered by French, Spaniards, and others in the 16th and 17th centuries. Its fortress was dismantled by Joseph II of Austria, 1781. The bishopric—1559–1801—brought Ypres some reputation when Cornelius Jansen (q.v.) held it 1636–38. Ypres has a museum, a library, and some textile and biscuit industry. Pop. (1935) 15,965. *Pron.* Eepr.

positions on Oct. 29, and succeeded in rolling up a part of the British line. But determined British resistance gave time for the arrival of reserves, who recovered almost all the lost ground. The last British reserves were sent up in buses to Ypres. On Oct. 30 a German attack on the Messines ridge was held at Messines, but the enemy gained some important positions, the British being pushed back towards Wytschaete and St. Eloi before the attack was brought to a standstill.

The salient shrank still more the next day, with the German artillery concentrating a violent converging fire on Ypres. At Gheluvelt eight German battalions assaulted and captured a position held by only 2,000 British, of whom 1,000 were taken prisoner; and part of Messines was taken by storm after a protracted struggle. The British artillery moved back, and Sir J. French had given orders for a general retreat; but after assurances of further French support he determined to stand firm.

Messines was lost on Nov. 1, but with the arrival of fresh French troops Wytschaete was held against all attacks, and the crisis had passed. Sir J. French ascribed to the timely arrival of French help the preservation of Ypres. Although Wytschaete was lost by the French the next day, the fighting about the Messines ridge thereafter died down.

New German attacks opened Nov. 5 near Kleine Zillebeke and Zwartelen, with little permanent result, but on Nov. 10 St. Eloi fell to a German attack from both sides. The last great assault of the year was delivered on Nov. 11, on the Ypres defences from Zonnebeke to Messines, 13½ German divisions

YPRES: THE BATTLES OF 1914-1918

The name of Ypres is immortalised in British history like those of the Aisne, the Somme, Jutland, and other places and regions associated with the most important battles of the First Great War. The courses of the first, second, and fourth battles of Ypres (1914, 1915, 1918) are outlined here. For the story of the third battle see under Passchendaele. See also Hill 60; Messines, etc.

Throughout the fighting on the western front in the First Great War, Ypres remained a key position just inside the British line, which projected in a "salient" (the Ypres salient) in front of the town, the extent of the salient varying as a result of the battles. The only time the Germans ever

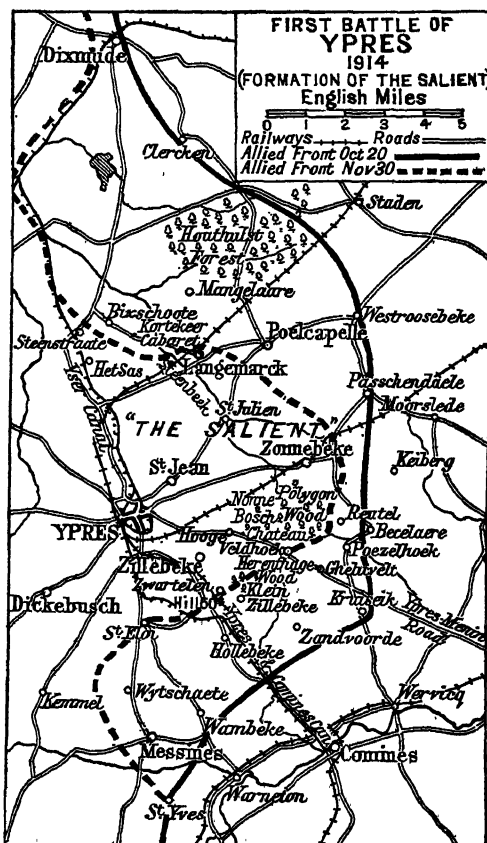
reached Ypres itself was for a few days in Oct., 1914, during the comparatively mobile

period when the opposing armies were racing to preserve an intact line to the coast, the Germans hoping to gain possession of the Channel ports. These German patrols were driven out by the British, then in process of taking up that position to the left of the Allied line which they maintained until the end of the war.

The German 4th army, with a total strength of 200,000, was at once deployed to turn the Allied left flank and seize Calais. Facing it stood the British cavalry corps and 7th div., holding Ypres; and to the left two French corps divs., and a French cavalry corps, with the French naval brigade on the Yser and six weak Belgian divs. on the coast. For the French and Belgian operations see Yser. For the British positions on Oct. 20, see map.

The Germans opened a great offensive on Oct. 21, driving back the French cavalry corps and thus threatening the British left flank. French reinforcements took up positions on the British left, Oct. 23. Throughout the preliminary stage the weak British front to the S. of Ypres had been

continually attacked (see La Bassée), but the German command now decided to break off this southern offensive and concentrated on Ypres. They attacked again with new and greater dis-



(200,000 men) being deployed. Twelve battalions of the German Guards div. attacked at Polygon Wood and Veldhoek in thick mist, only 2,500 British and French opposed them. They were repulsed with heavy loss, but a German advance was made through Nonneboschen Wood to Hooze Château. The situation was critical for the British. Orderlies and transport men held up the Germans until other troops arrived to counter-attack. Further S.W., Hill 60 was taken by the Germans in heavy rain. But thereafter the fighting died down again, and a further severe German repulse on Nov. 17 led to the abandonment of the offensive. German losses in the whole series of engagements totalled over 150,000. British losses were approx. 50,000, the French rather more. The total Allied force engaged was 263 battalions against 426 German battalions of much greater strength.

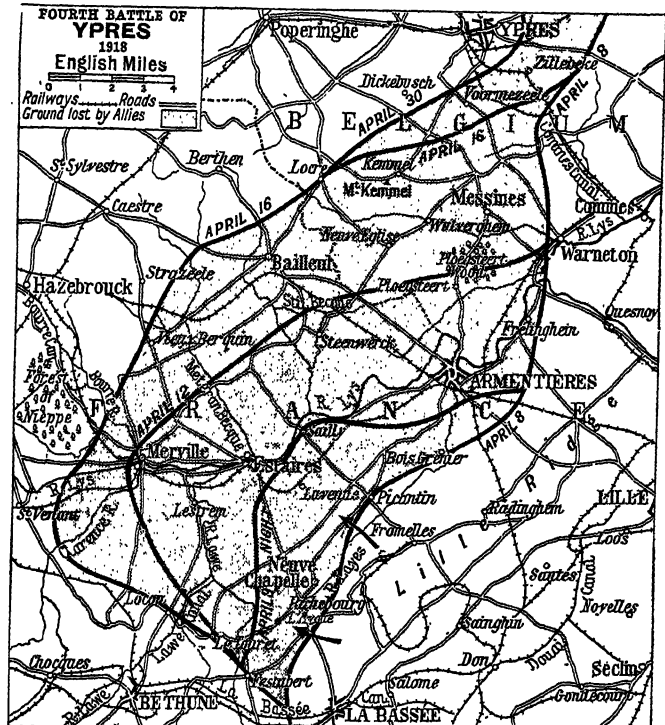
Local engagements continued in the region of the salient. The Allies lost Langemarck in Dec., 1914, and recaptured St. Eloi in March. Full-scale fighting broke out again in April. Hill 60 was captured by the British on April 17. But the German 4th army opened a heavy attack on April 22, along the N. section of the front, from

Second Battle, April-May, 1915

Steenstraete to Langemarck. Opposing them were Belgian troops on the Allied left, then a French colonial div., then E. of Langemarck two Canadian brigades.

This German attack is notorious as the one in which poison gas was used for the first time, in this case chlorine gas, discharged from cylinders in a cloud. The French colonial troops were the first victims to an attack against which all were at that time defenceless. German infantry advanced behind the gas cloud. The flank of the 3rd Canadian brigade was left in the air. If it had yielded, Ypres was lost. But it held. The Canadians were drawn back to a defensive line along the Ypres-Poelcapelle road, while Canadian artillery pounded the advancing German infantry. There were Canadian counter-attacks at midnight and again next day, which carried the Allied front 1,000 yards N. at heavy cost. But the Germans had crossed the Yser canal in the gas onslaught, and the whole position was critical.

The Germans released more gas on the 24th and attacked in force



between St. Julien and Gravenstafel, pushing back the depleted 3rd Canadian brigade to S.W. of St. Julien. British attempts to retake St. Julien on April 25 were frustrated. But the German attacks had now lost their first vigour. Moreover, rudimentary gas masks had now been contrived, and an attack on May 2, again behind a gas cloud, was beaten back. Minor adjustments of the British front followed; and a great gas attack to the E. gave Hooze to the Germans on May 24. But this 2nd battle of Ypres slowly died down. The German aim was probably no more than an attempt to paralyse the Allies by a demonstration of strength while their real offensive of the year was being directed against Russia. The Canadians covered themselves with glory in this battle but at the cost of some 6,000 men.

The 3rd battle of Ypres is the official name for the bitter and disillusioning struggle of July-Nov., 1917, now more generally written of as Passchendaele (*q.v.*).

The 4th battle of Ypres is sometimes called the battle of the Lys. It was part of the final gigantic German offensive of 1918. In the hope of easily capturing the high ground W. of the Lys, and S.W. of Ypres, which was the

key to the defence of the salient, Ludendorff opened an attack on both sides of the Lys on April 9, with a violent barrage of gas and

Fourth Battle or Battle of the Lys

H.E. shells, especially on the sector temporarily held by Portuguese troops. British forces in this quarter (1st army) had been weakened by the withdrawal of 10 divisions for the 2nd battle of the Somme and their replacement by divisions exhausted in that battle, reinforced by young and inexperienced drafts from home. The German infantry advanced in overwhelming strength, covered by thick mist, and by striking at the Portuguese line tore a great gap in the British front and poured through it, overrunning the British heavy artillery positions. A great catastrophe seemed in sight. But the British to N. and S. of the Portuguese held firm. To the S. they swung the flank back to Le Touret where they linked with those of the N. and closed the gap.

The 55th division distinguished itself greatly at Festubert, where it put up a desperate defence and broke the initial energy of the German assault. But the British were pushed back at Sailly, and at Estaires. Ploegsteert Wood was

lost and Armentières abandoned on April 10. The next day further German advances towards Merville compelled the evacuation of the Messines positions. The British front was broken from Merville to S.W. of Bailleul. But every available man was brought up and the Germans were held. On the night of April 12 troops in this line were directed to hold to the last.

It was at this point that Haig's memorable order was issued:

Every position must be held to the last; there must be no retirement. With our backs to the wall, and believing in the justice of our cause, each one of you must fight on to the end. The safety of our homes and the freedom of mankind alike depend on the conduct of each one of us at this critical moment.

Australian and French reinforcements arrived and the crisis passed, though more ground had to be abandoned. Bailleul was lost on the 15th, and on the same night the British at Ypres withdrew to positions in front of the town in case a general retreat from Ypres became necessary. On April 16-17 a determined German attempt to pinch out the Ypres salient was repulsed, and the fighting died down for a few days.

It was resumed on April 22, and during following days the Germans stormed Kemmel Hill and took Loere, and on April 27 a supreme German effort was made with 120,000 troops to break through on an 8-mile front from Loere to Dickebusch. But they were repulsed at every point, and on the following day were driven back E. of Loere. This marked the end of the battle, with the gain of much ground by the Germans, at very heavy cost, but of none of their ultimate objectives.

Ypres, JOHN DENTON PINKSTONE FRENCH, 1ST EARL OF (1852-1925). British soldier. Born at Ripple, Kent, Sept. 28, 1852, of Irish stock, he was first intended for the navy, but after four years as cadet and midshipman, he left to join the militia. In 1874 he was commissioned in the 8th Hussars, later transferring to the 19th. Captain 1880, and major 1883, he first saw active service in the Sudan campaign designed to relieve Gordon at Khartum, 1884. In 1889 French obtained command of the 19th Hussars, but left it after five years to become asst. adjutant-gen. of cavalry. In 1897 he was given command of the 2nd cavalry brigade, and in 1899 of the 1st cavalry brigade, as temporary major-general.

French was one of the few officers to establish a name in the

S. African War. As major-general he commanded the cavalry div. in Natal. He led the relief of Kimberley, then cut off Cronje as he escaped from Paardeberg; and commanded the cavalry in the operations ending in the capture of Bloemfontein and Pretoria. He was in charge of the operations in the eastern Transvaal until the end of the war. He was rewarded with the K.C.B., K.C.M.G., and the rank of lieutenant-gen., with the Aldershot command, which he held until 1907, when he became full general and succeeded the duke of Connaught as inspector-general. In 1912 he followed Sir W. Nicholson as C.I.G.S., and in 1913 was made field-marshal.

He resigned in 1914 following the government's action over the resignation of British officers at the Curragh (*q.v.*), but on the outbreak of war was chosen to lead the B.E.F., and was in command during all the early decisive stages of the fighting in the western front. By Sept. 16 he had decided that frontal attack was useless and began to urge the march to Belgium to prevent German capture of the Channel ports. His views slowly prevailed, though not in their entirety, and the great 1st battle of Ypres was a result. All this time and until the end of the battle of Festubert in May, 1915, French had pressed the supply of ammunition, especially high explosive shells, on a scale previously unimagined. He enlisted the support of Col. Repington, military correspondent of *The Times*, and Repington's publication of the facts helped to create the political crisis which established the first coalition govt.

It had become increasingly evident that French found it difficult to cooperate with Joffre and even with his own corps commanders. He was often persuaded to a course of action in which he had little faith, and its subsequent execution left much to be desired. The expensive and fruitless actions at Neuve Chapelle, Festubert, and Hooge, in early 1915, provoked many doubts. Moreover, he exposed himself to criticism by first commending Smith-Dorrien's action at Le Cateau, then later stating that it had imperilled the safety of the whole army. Then,



1st Earl of Ypres,
British soldier

after the battle of Loos, Sept., 1915, he endeavoured to place the responsibility for failure on Haig by misdating the time at which the reserves had been sent forward. This moved the govt. to action, and at the end of 1915 French surrendered his command to Haig, and was placed in command of all troops in the U.K. until appointed lord-lieutenant of Ireland 1918-21. He became a viscount in 1916 and an earl in 1921, and died May 22, 1925, being succeeded by his son John (b. 1881). Among the many honours of the 1st earl were the O.M. and the K.P. In 1919 he published an angry and controversial book about the so-called "shell shortage" with the title "1914." *Consult* Life, by his son, the Hon. G. French, 1931.

Ypsilanti. Name of a family of Greek patriots. Of the Phanariotes class, claiming descent from the imperial family of Comnenus, the first Ypsilanti was Alexander (1725-1805), hospodar of Wallachia during 1774-98, who was executed at Constantinople for suspected plots against the sultan. His son Constantine (1760-1816) was also a hospodar until 1805, when, assisted by Russia, he attempted the liberation of Greece, but failed and retired to exile in Kiev. His eldest son Alexander (1792-1828) served against Napoleon in the Russian army, and rose to be major-general. In 1821 he headed a rising against the Turks and proclaimed the independence of Greece at Jassy, but was defeated by the army of the Porte at Dragashan, June 19, fled to Austria, and died Jan. 31, 1828. His brother Demetrius (1793-1832) took part in the Greek rising of 1821, and forced the Turks in East Hellas to capitulate in 1829. He died Jan. 3, 1832.

Ysaÿe, EUGÈNE (1858-1931). Belgian violinist. Born at Liège, July 16, 1858, he studied there, under Wieniawski at Brussels, and in Paris until 1879. In 1886 Brussels conservatoire made him professor of the violin. His fame was firmly established in England by recitals in 1889, and he first visited the U.S.A. in 1894. He was to go back during the First Great War as conductor at Cincinnati. From 1922 he was playing in Europe until his death, May 12, 1931. One of the foremost violinists of his day, Ysaÿe excelled in Bach and Franck. He also composed a symphony, which was performed in 1905 in London, as well as an opera, *Peter the*

Coalminer, 1929. In 1947 appeared a study by his son Antoine and B. Ratcliffe.

Yser (Flemish Ijzer). River of France and Belgium. Rising near Noorpeene, in Nord dept., France, it flows N. and N.E. to Dixmude, where it turns N. to enter the North Sea at Nieuport (*q.v.*). Normally navigable over the greater part of its course, it is linked by canal with Furnes from Westvleteren. Length is 55 m.

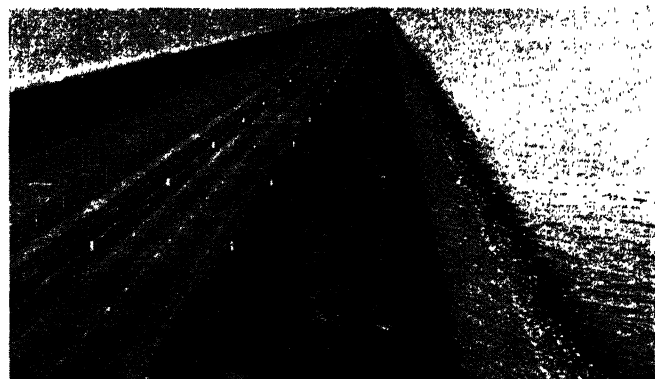
Yser, BATTLE OF THE. Action of the First Great War. This battle, fought Oct. 15-31, 1914, as the last act in "the race to the sea" between the Allies and the Germans after the Aisne, was the successful defence of the line of the river Yser from Nieuport to Dixmude by the Belgian army with French support against the 4th German army. The Belgians were weak after their difficult retreat from Antwerp and numbered only 48,000 rifles. Behind the Yser, which forms a projecting arc from Nieuport to Dixmude, runs a railway embankment forming the chord of the arc, raised above the low and swampy ground, which is below the level of the sea at high water and can be flooded by opening sluices at Nieuport. By Oct. 20, the Allies were forced back to the W. bank of the Yser except at Nieuport and Dixmude. The Germans crossed on the 22nd. On the 24th fifteen assaults were delivered by the German troops. The Belgian shells were almost exhausted, and the Belgian staff was contemplating retreat to Dunkirk, when the flooding of the country was adopted.

At first the wrong sluices were opened and the water rose very slowly. On the 29th the Germans made preparations for a final attack. In the night the Belgians opened the main sluice in "No Man's Land" and the sea poured in; on the 30th the German infantry advanced. They penetrated beyond the embankment, and for some hours everything seemed lost. But on the 31st the Belgians and a French division counter-attacked and drove out the Germans, hundreds of whom perished in the inundations. The Allied loss was over 20,000, and that of the Germans probably double. The line of the Yser, S.E. of Dixmude, was thereafter held by the Allies.

Yssel. River of the Netherlands. A distributary of the lower Rhine, it branches off 2 m. above Arnhem, and flows N. and N.E. through the provs. of Gelderland

and Overijssel to enter the Yssel Meer near Kampen. On its banks are Zutphen, Deventer, and Kampen. Its length is 87 m.

Yssel Meer (Yssel mere). Lake of the Netherlands. A remnant of the former Zuider Zee (*q.v.*), it had by 1944 become virtually a fresh water lake. It is 470 sq. m. in extent. See Netherlands:



Yssel Meer. Part of the barrage between N. Holland and Friesland cutting off the Yssel Meer (formerly the Zuider Zee) from the North Sea

Land Reclamation, and map; Wieringen.

Ystad. Seaport of Sweden, in the extreme S., in the län or govt. of Malmöhus. Situated on the Baltic, 41 m. by rly. E.S.E. of Malmö, it has shipbuilding yards, iron foundries, sugar refineries, and match, tobacco, chemical, and chicory factories. Pop. 11,556.

Ythan. River of Aberdeenshire, Scotland. It rises at the village of Ythan Wells, 7 m. E. of Huntly, and flows generally E. through Fyvie, Ellon, and Slains to the North Sea, where it discharges 12 m. N. of Aberdeen. Its length is 35 m.

Ytterbium. Rare chemical element, whose symbol is Yb, discovered in 1878 by Marignac in the mineral gadolinite. In 1907 Urbain announced that he had been able to separate ytterbium by fractional crystallisation in nitric acid into two elements, which he called neoytterbium and lutecium. Atomic weight is 173.04; atomic number 70.

Yttrium. One of the metallic elements. Its chemical symbol is Y, atomic weight 88.92, atomic number 39. It is a dark grey powder, and is found in the mineral gadolinite and other rare earths, notably the cerium group.

Yucatan. Maritime state of Mexico. In the Yucatan penin-

sula, it has a coastline on the Gulf of Mexico, covers an area of 23,926 sq. m., and has a pop. of 418,210. Quantities of sisal hemp are produced. Mérida is the capital. See Aztec.

Yucatan Peninsula. Land mass of Central America. It comprises the Mexican states of Campeche and Yucatan, the federal

dist. of Quintana Roo, and parts of the Central American states of British Honduras and Guatemala; and separates the Gulf of Mexico from the Caribbean Sea. It measures about 400 m. in length and some 200 m. in breadth. Here are forests of mahogany, rosewood, and other valuable woods, yielding hennequen or sisal hemp, maize, rice, and tobacco. The peninsula is rich in antiquities. First visited by Spaniards in 1508, Yucatan remained a Spanish possession until 1821, and in 1852, after a period of independence, became part of Mexico.

Yucca. Genus of plants of the family Liliaceae. See Adam's Needle.

Yudenitch, NIKOLAI NIKOLAEVITCH (1862-1933). Russian soldier. Born July 18, 1862, he entered the Russian army 1879, saw active service in the Russo-Japanese War, and at the outbreak of the First Great War was chief of staff, and virtually *c.-in-c.* of the army of the Caucasus. Early in 1915 he defeated the Turks under Enver Pasha there, and in 1916, with the Grand Duke Nicholas as his titular chief, conquered all Turkish Armenia. He led an army against the Bolsheviks near Petrograd (Leningrad) in 1919, was defeated, and went into retirement. He died Oct. 6, 1933.

YUGOSLAVIA: BALKAN REPUBLIC

Hágar Stern-Kubarth, Ph.D.

Here is an account of a country, at first a kingdom, later a republic, which came into existence after the First Great War. Further information is to be found in articles about its constituent parts, Bosnia; Croatia; Herzegovina; Montenegro; Serbia, etc.; and under names notable in its history, e.g. Karageorgevitch; Mihailovitch; Tito. See also Trieste; Venezia Giulia; Zadar

Yugoslavia (Serb-Croat Jugoslavija, South Slavia), the state created at the end of the First Great War by the amalgamation of the previously Austro-Hungarian counties of Bosnia-Herzegovina, Dalmatia, Croatia-Slavonia, and parts of Carniola (Slovenia) with the kingdoms of Montenegro and Serbia under the Serbian Karageorgevitch dynasty, is situated between the Adriatic Sea and the middle Danube, the Alps and the Macedonian mts. Until 1929 its official name was kingdom of the Serbs, Croats, and Slovenes; in Nov., 1945, it adopted the style Federal People's Republic of Yugoslavia.

Except in the fertile plains of the Danube and the Save to the W. and N.W., Yugoslavia is a mountainous country whose highest elevation, in the S.E. Alps, is Triglav mt., 9,450 ft. The chief river, crossing the country from the extreme N.W. to Belgrade, where it joins the Danube, is the Save, navigable for nearly its whole course; its tribs. Bosna and Dvina, the Morava flowing into the Danube, and the Narenta flowing into the Adriatic, are other rivers of importance. The climate in the Mediterranean zone and beyond the mts. varies considerably. The seashore and the islands are evergreen; in the forest which covers some 40 p.c. of the interior, bear and wolf thrive as well as the usual European game.

Division of Population

The people, chiefly of southern Slav blood, are sharply split by religious and cultural differences, results of a long historical development on different lines, and of the widely different nature of the country's three principal sections. Although during and in consequence of the Second Great War something like 2 million lives were lost, the pop. was estimated at 15,324,500 on Jan. 1, 1947 (compared with 13,930,918 in 1931), of whom 46 p.c. were Serbs, 28.5 p.c. Croats, 8.5 p.c. Slovenes, the remainder being Magyars, Albanians, and others. The Croats are fine sailors, having produced notable admirals as well as notorious pirates. Most Croats and Slovenes, for centuries under Hapsburg rule, are

R.C., and, though their language is very like that of the Serbs, they write it in Latin letters; the Serbs have their own branch of the Orthodox church and use the Cyrillic alphabet. Forty-nine p.c. of the people are Serbian Orthodox, 38 p.c. R.C., 11 p.c. Mahomedan. Before the expulsion after the Second Great War of a large part of those of German extraction settled for centuries in the N. and the Bačka and the Banat, E. of the Danube, 2 p.c. of the pop. was Protestant. All religions have the same standing. The Orthodox church is ruled by a patriarch at Belgrade and a holy synod, and has 21 bishoprics; the R.C. church has 28 suffragan sees and 5 others dependent directly on Rome; the Muslims have a *reis-ul-ulema* at Sarajevo as their spiritual head.

Agriculture and Industry

Yugoslavia had an area of 96,220 sq. m. before the Second Great War, after which it was enlarged by the cession under the peace treaty with Italy of the greater part of Venezia Giulia, the commune of Zara (Zadar), and the island and islets of Pelagora, with a total of some 3,500 sq. m. More than half the land is under cultivation, producing maize, wheat, plums, wine, tobacco, apples, and vegetables. Before the Second Great War 80 p.c. of the pop. worked on the land; Yugoslavia came next to Argentina in the export of maize, while she was first for plums and prunes. She also exported many cattle and pigs. Industries comprised textiles, meat preserving, leather working, sugar making, brewing, distilling, and other activities based on agriculture. Copper was mined at Bor, coal between the Morava and the Danube and in central Croatia, lignite in Slovenia. There are also lead, zinc, antimony, chrome, bauxite, and salt deposits. A five-year plan, adopted April 28, 1947, aimed at developing industry, especially engineering, and at mechanising agriculture. In 1948 there were 450 state farms covering 750,000 acres; many others became part of cooperative units. All parcels of land in excess of 90 acres formerly privately owned had been confiscated.

Yugoslavia has some 6,700 m. of rly. and about the same length of state highways, including 500 m. of motor roads, as well as more than 14,000 m. of second class roads. Water transport is well developed both from port to port along the coast and along the Danube. Belgrade has an international airport, and there are internal air services. Before Nazi pressure forced Yugoslavia to trade chiefly with and through Germany, her exports went principally to Italy and Austria, her imports came from Czecho-Slovakia and Austria, Germany ranking third, the U.K. sixth, in her foreign trade.

There are six towns of more than 50,000 inhabitants each: the capital Belgrade (1947 est. 267,000); Zagreb in Croatia, 185,580; Subotica, 110,000; Skopje, 65,000; Ljubljana in Slovenia, 60,000; Fiume (Rijeka), 54,000. Sarajevo had 78,182 inhabitants in 1931, but lost a considerable part of its pop. after 1941. There are universities at Belgrade (1838), Zagreb (1874), and Ljubljana (1919). Elementary education is free and compulsory.

HISTORY. The Croats were probably the earliest settlers of the country. The Chorvati and Serbi mentioned by Byzantine authors immigrated from eastern Galicia into their present country, which was under Roman rule and influence from the first century A.D., in the course of the 6th century. They became independent of Byzantium 1180 and had their own kings from 1217, their own church under a patriarch from 1219. Under Stephen Dusan (1331-55), who called himself tsar of the Serbs and Greeks, they had a short period of far reaching power, but at Kossovo in 1389 were vanquished and subjugated by the Turks. Supported by Russia, they began to revolt against that domination in 1804, under Karageorge, and finally gained in 1816 a measure of autonomy under Serbian princes for the area which became in the course of the Russo-Turkish War of 1877-78 the independent principality (from 1882 the kingdom) of Serbia.

From about the middle of the 19th century, a Yugoslav movement developed, especially in Croatia, at first without any definite trend towards union with Serbia. Serbia's gains in the Balkan Wars (q.v.), 1912-13, and the events of the First Great War produced closer relations among the S. Slav movements and led to the creation, in London in 1915, of a Yugoslav committee. The independent triune state of Serbia, Croatia, and

Slovenia, proclaimed at Corfu in 1917, became a fact Oct. 6, 1918, at Zagreb. The new kingdom, under the Kara-georgevitch dynasty, was proclaimed Dec. 1, 1918, and the treaties of St. Germain and Trianon confirmed its territory within boundaries that remained until the Second Great War. Montenegro joined the new state in Nov., 1918.

The new state had many troubles, chiefly the result of a strongly centralist trend of dynasty and govt., led until 1926 by the powerful Pašić, and resisted by the Croats, under Stephen Radić, and by the Slovenes. A republican trend developed among the opposition, and the clashes with Italy, which cost Yugoslavia Zadar in 1920 and Fiume in 1924, and were to lead to her encirclement by Mussolini's taking Albania under his "protection" in 1926-27, hindered compromise in home politics. Radić who, after a term in prison, joined the cabinet 1925-26, was assassinated in the chamber in June, 1928; and Alexander II by a *coup d'état* on Jan. 6, 1929, abolished constitution, parliament, and parties, and established a military dictatorship. He was assassinated Oct. 9, 1934, at Marseilles. His son Peter, a minor at school in England, succeeded him, with Alexander's younger brother Paul as regent.

Nazi pressure was exerted, first upon Yugoslavia's economy, and then upon her foreign policy, which was based on an alliance with France, dating from the creation of the state, and upon the Little Entente (*q.v.*) with Czecho-Slovakia (Aug. 14, 1920) and Rumania (April 23, 1921). The occupation of Czecho-Slovakia by the Nazis in March, 1939, and the pro-Nazi dictatorship in Rumania led to the surrender of the Yugoslav regency council when, in the spring of 1941, Hitler menaced the country; the people's spontaneous resistance, which forced Prince Paul to flee, transformed Yugoslavia into a theatre of guerrilla hostilities throughout the rest of the Second Great War.

In Croatia a Nazi puppet govt. was set up under Ante Pavelić.

one of those who plotted the assassination of Alexander II. At first Col. (later Gen.) Mihailovitch led the resistance by remnants of the regular forces and partisan troops, with some.

Allied support. In the course of 1942, however, left-wing partisans led by Josip Broz (Tito) took an ever more important part in fighting the invaders, Tito being recognized as a full Allied commander in Dec., 1943, and Allied help to Mihailovitch being withdrawn. Backed in the last stages of the struggle by Russian forces, Tito established a Communist govt. after the expulsion of the Germans. A constitution adopted by a national assembly Jan. 31, 1946, organized the country as a federation of the six republics of Serbia, Croatia, Slovenia, Montenegro, Macedonia, and Bosnia-Herzegovina, with two autonomous provs., Vojvodina and Kosovo-Metohija. There is a parliament of two chambers elected for four years—a federal assembly and a house of the peoples—which elects the presidium, or executive body, the president of which is head of the state.

The constitution decreed separation of church and state; women's suffrage; nationalisation of industry, transport, and distribution; confiscation of land in excess of 90 acres; and state control of foreign trade. In Jan., 1946, the primate, Archbishop Stepinac, was sentenced to 16 years' hard labour for opposing govt. measures; Mihailovitch and other officers were shot as traitors on July 17. Friend-

ship and mutual assistance treaties were signed with Bulgaria, Hungary, and Rumania during Nov.-Dec., 1947. But Tito's strongly nationalist regime, and his refusal to conform to the views of Moscow on the development of his country, led in July, 1948, to the expulsion of Yugoslavia from the recently formed Cominform, and the withdrawal of Russian support for Tito, whose country's needs compelled him to expand trade with the U.S.A. and the U.K., and to agree on compensation for expropriated British property.

LITERATURE AND THE ARTS. The Yugoslavs have considerable artistic gifts. Their simple folk-songs were made world-famous by Vuk Karadžić's collection, 1814-15. King Stefan Nemanja's chronicle, 1207, is the oldest known Serbian manuscript. In Mestrovich they produced an impressive and sophisticated sculptor. Modern writers include the Croats Dinko Simunović, Zofka Kveder, Miroslav Križar; the Serbs Borislav Staneković, Petar Kočić, Ivo Andrić; the Slovenes Ivan Cankar, Ivan Pregelj, Milan Jarc; many works by these authors were translated into other languages during the 19th century. French influence later made itself strongly felt, although dramatists, like Laza Kostić (1841-1910), were affected



by, and the lyric poet Oton Zupančič (b. 1878) made interesting translations of, Shakespeare.

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Yukagir. Autonomous prov. in the Yakutsk republic, U.S.S.R. Verkhoyansk is the capital. See Verkhoyansk; Yakutsk.

Yukon. River of Canada and Alaska. Consisting of the combined waters of the Lewes and Pelly rivers, which unite at Fort Selkirk in Canada, it flows N.W. into Alaska, and, after a total course of 2,300 m., enters the Bering Sea by a large delta. The Lewes, which is included in the

length specified above, rises in Lake Bennett, near the Chilkoot Pass. The navigable season is from late May to early Oct.; stern-wheel steamers can reach Dawson City 1,400 m. upstream.

Yukon. Territory of Canada. It was made into a separate political unit in 1898, just after the discovery of gold in the region of the Klondike river; it was previously part of the Mackenzie dist. of the North-West Territories. Its area is 207,076 sq. m., and it is bounded by the Arctic Ocean, Alaska, British Columbia, and the N.W. Territories. Mt. Logan is 19,500 ft.; Mt. St. Elias and other peaks exceed 15,000 ft. The chief river is the Yukon.

Yukon is governed by a controller and an elected legislative council of three, and sends one representative to Ottawa. Dawson City is the capital; White Horse, in the S., is a mining settlement. The chief industry is mining gold

on the Klondike, but silver, lead, and coal are also worked. Spruce, balsam, birch, poplar, and cottonwood occur. Moose, caribou, bear, and other wild animals are plentiful. There is a rly. running from Skagway in Alaska to White Horse. Pop. 4,914.

Yukon Particle. Name at one time applied to the sub-atomic particle more often termed a Meson (q.v.).

Yunca (Quichua *Yucacuna*, inhabitants of a hot land). Name of an ancient Peruvian nation. They lived on the Pacific coast, with their capital near the modern city of Trujillo (q.v.). Yunca culture produced some of the greatest prehistoric works of S. America, such as those near Trujillo. See Peru.

Yunnan (south of the clouds). Most south-westerly prov. of China, touching Indo-China on the S. and Burma on the W. It covers 162,342 sq. m. Largely mountainous, it rises to 16,000 ft. in the W., with a slope from N. to S., while the other half is a broken plateau at an average alt. of 5,000 ft. Among many rivers, the Salween and Mekong have cut deep channels, and the Yang-tse touches Yunnan in the N. The prov. is heavily forested and rich in minerals; it yields 90 p.c. of the nation's tin and has had a mining industry for centuries; also copper, lead, zinc, tungsten, and some gold, coal, salt, and gypsum. Agricultural products are tea, tobacco, rice, wheat, and silk. Kunming (Yunnanfu) is the capital; Koki the tin centre; Tali a beauty spot; Mengtze, Szemao, and Tengyueh are other places. Important rlys. run and others are under construction to Indo-China and Burma. The celebrated Yunnan-Burma road was for many years the only land route from China to the Indian and Pacific Oceans. Population 10,853,359, many being Muslims. See Ledo Road.







Yuriev. Russian name of the Estonian town of Tartu (q.v.).

Yusafzai. Pathan tribes of the Indo-Afghan frontier. Iranian Aryans, their N. Pushtu dialect was the first to receive a literary garb (15th century). They extend along the Kabul river into the Peshawar dist. N. of the allied Mohmand.



Yverdon (anc. Ebrodunum). Town of Switzerland, in the canton of Vaud. It stands at the S.W. end of Lake Neuchâtel, near the influx of the river Orbe or Thièle, 20 m. by rly. N. of Lausanne. Pop. 10,865.



Yukon. Map of the gold-mining territory of Canada

THERE was an ancient Egyptian hieroglyph representing a duck  which in the later hieratic form  was simplified to . This was the rudimentary Z of the Roman alphabet, though it went through somewhat surprising changes in its intermediate history. As the Hebrew and Phoenician letter *zayin* (weapons) , the Egyptian duck was barely recognizable.  This form was developed into the classic Greek *zeta*  **I**, which, however, had



an uncial parallel  **Z**, in which the vertical stroke became a  diagonal. The two forms were used in the early Latin alphabets, but disappeared in the 3rd century B.C. The **Z** form was restored later, when the study of Greek became a mark of culture among the Romans; but by this time it had lost that 7th place which it had held in the Phoenician, Greek, and early Latin alphabets, and was added to the tail end as an extra letter; and so it remains to this day.

Z Final letter of the English and Latin alphabets.

It is a soft sibilant, or hissing sound. In the Latin alphabet its use is reserved for Greek words. Its usual English value is that of *s* in *rose*. Nearly all words in modern English beginning with *z* are of foreign origin. See Alphabet; Phonetics.

Zaandam. Town of the Netherlands, in the prov. of N. Holland. It lies on the river Zaan, in the midst of extensive polders, $5\frac{1}{2}$ m. by rly. N.W. of Amsterdam. There are shipyards, and the industries include flour milling, papermaking, and timber sawing. Pop. 40,529.

Zabrze. Town of Silesia. It lies about 45 m. S.E. of Oppeln, and is an important coal-mining and manufacturing centre, with coke furnaces and steel and cable works. Formed in 1905 by the amalgamation of several smaller places, it was renamed Hindenburg, Dec. 4, 1915, in honour of the German general of that name. When the Second Great War began, it had a pop. of 122,000. Taken by assault Jan. 26, 1945, by Marshal Koniev's 1st Ukrainian army, it was in the part of Germany placed under Polish administration in 1945 by the Potsdam agreement, when it reverted to its old name of Zabrze. Pop. 104,184.

Zacatecas. Central state of Mexico. Forming part of the great central plateau, it has a mean alt. of 7,750 ft. It has valuable silver mines, and copper, lead, and quicksilver are also largely worked. Some cereals, sugar, and fruit are grown. Area, 28,122 sq. m. Pop. 565,437. Zacatecas, the capital, is a centre of the mining industry, 65 m. N. by W. of Aguascalientes.

Zacharias. Father of John the Baptist, mentioned in Luke 1. A priest, he expressed disbelief in the message of Gabriel concerning his future son, and was struck dumb, but after the circumcision of John recovered his speech, to prophesy in the words of the Benedictus.

Zacharias (d. 752). Pope 741-752. A Greek of Calabria, he secured by personal influence the

protection and restoration of papal territory from Liutprand, king of the Lombards, and made S. Boniface his papal legate in Germany. He died in Rome, March 14, 752, and was later canonised.

Zadar (Ital. *Zara*). Seaport of Yugoslavia, on the Dalmatian coast, 72 m. N.W. of Split. The Roman *Jadera*, it came under Venetian domination in the 12th century, and was lost and regained by Venice a number of times. Seized by Austria in 1813, it became the capital of Dalmatia under the Austro-Hungarian monarchy. By the treaty of Rapallo (*q.v.*) it was assigned to Italy, which ceded it to Yugoslavia under the peace treaty of 1947. The round church of S. Donatus was built in the 9th century over the pavement of the Roman forum. The Romanesque cathedral dates from the 12th century, the tower being finished in 1893; the church of S. Francis was begun in 1212 on the site of a church which existed from 906; and the loggia which houses the municipal library was constructed in 1565. The object of a number of Allied attacks from the air during the Second Great War, Zadar was captured by Marshal Tito's forces after three days' fighting on Nov. 2, 1944.

Zadkiel. Pseudonym of Richard James Morrison (1795-1874), writer on astrology. Born June 15,

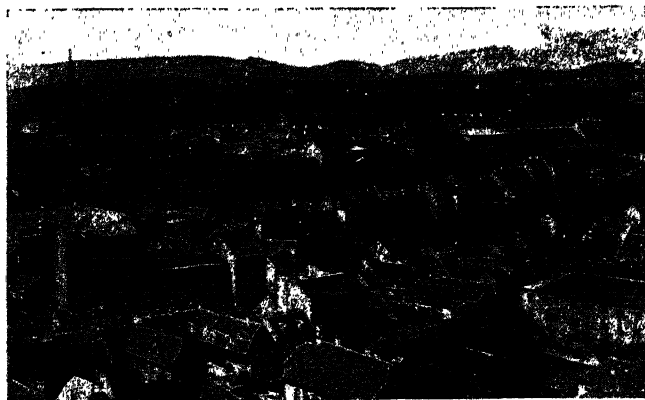
1795, he entered the navy in 1806 becoming lieutenant in 1815; served in the coastguard, 1827-29; and in 1831 founded *The Herald of Astrology*, known later as *Zadkiel's Almanac*. Also author of controversial works on astronomy, he died April 5, 1874.

Zadok. Biblical character. A priest in David's reign, he remained faithful during the revolt of Absalom (2 Sam. 15), and was raised by Solomon to the high priesthood (1 Kings 2). This office was held by his descendants until the rise of the Maccabees. *Zadok the Priest* is the title of an anthem composed by Handel for the coronation of George II.

Zafrin, ZAFFARINE, OR CHAFARINAS. Islands off the N.E. coast of Morocco. Occupied by the Spanish government in 1848, they are situated near the mouth of the Muluya and the Algerian frontier.

Zagazig. Town of Egypt. A rly. junction, it is situated 40 m. W. of Ismailia, and is the centre of a large trade in cotton. Near by are the remains of the ancient Bubastis (*q.v.*). Pop. 82,912.

Zagreb (Ger. *Agram*; Hung. *Zágráb*). Second city of Yugoslavia. The ancient Croatian capital, it stands near the left bank of the Save, 75 m. N.E. of Fiume, with which there is rly. connexion. Its chief buildings include the 15th century Gothic cathedral, archi-



Zagreb, Yugoslavia. General view of the ancient Croatian capital and second city of Yugoslavia

episcopal palace, palace of the ban or governor, university founded in 1874, and natural history museum. Divided into three parts—the episcopal, upper, and lower towns—it manufactures leather, linen, carpets, rly. wagons, etc., and trades in wine, cereals, hides, potash, porcelain, and silk. Pop. 185,581.

Founded 1093 by Ladislav I, Zagreb became a royal free city in 1242, and the capital of the Hungarian prov. of Croatia-Slavonia in 1867. In 1918, when the Austro-Hungarian empire was breaking up, a Croatian provisional govt. was set up here. Zagreb suffered from earthquakes in 1880 and 1901. The city was in German occupation and was bombed by the Allies during the Second Great War. Marshal Tito's forces entered it May 8, 1945. A new road from Zagreb to Belgrade was completed 1949.

Zaharoff, SIR BASIL (1849-1936). Anglo-Greek financier. Basilios Zacharias was born Oct. 6,



Sir Basil Zaharoff,
Greek financier

1849, a Turkish subject of Greek extraction, at Mughla, Anatolia. After a chequered career, allegedly as a pedlar, guide, and agent for European goods at Constantinople

(Istanbul), he became in 1877 the employee of a British firm of armament makers, negotiating sales of weapons in the Near East. In contact with Maxim, whose machine-gun Zaharoff helped to introduce, he won a leading position from 1897 in the Vickers-Maxim combine and was counted among Europe's richest men. For lavish contributions to the propaganda of the Entente and for rearming Russia and smaller allies during the First Great War, he was knighted in 1919. His influence was said to have helped persuade the British govt. to support the Greek attack on Turkey. In the 1920s he financed Rumanian loans and oil enterprises, held a big share in the Anglo-Persian Oil co., and bought up the bank and casino at Monte Carlo. Rumour connected "the mystery man of Europe" with many minor wars and revolts; but in Greece his machinations were evidently due to sincere attachment that made him spend huge amounts irrespective of potential gains. He was in personal touch with Venizelos, as well as Lloyd George, Clemenceau, and Briand. Founder of chairs of

aviation at London, Paris, and Leningrad, and of French literature at Oxford and English at Paris, he was honoured by many countries. He later lived mostly on the Riviera, where he died Nov. 27, 1936. *Consult* Z., Armaments King, R. Neumann, 1935.



Zamia. Large divided leaves and cone of *Z. furfuraceae*

Zama. City in the Roman prov. of Numidia. It was five days' march S.W. of Carthage, near Sica Veneria (El Kef), and was the scene of the defeat of Hannibal by the younger Scipio in 202 B.C., which ended the second Punic War.

Zambezi or **ZAMBESI**. River of Africa. Its headstreams rise in N. Rhodesia, Belgian Congo, and Angola, near those of the Kasai, a large affluent of the Congo, and it flows with a great double curve to its deltaic mouth in Mozambique on the E. coast of the continent. Above Victoria Falls (*q.v.*) the river flows over a level plateau, savanna in character; below the falls it traverses gorges and ravines; from Kebrahasa Rapids it is navigable for 400 m. to its mouth, where is a delta covering 2,500 sq. m. Its length is 1,600 m. The chief affluent is the Shiré (*q.v.*). In 1935 was opened the Lower Zambezi rly. bridge (4,021 yds., the longest in the world), connecting Nyasaland with Beira. *See* Africa.

Zambezia or **ZAMBESIA**. Prov. of Mozambique. It consists of two portions joined together by a narrow strip of country N. of the Zambezi, and includes the Tete dist. and the old dist. of Quillman, with that seaport its chief town. It adjoins N. and S. Rhodesia and Nyasaland. The Trans-Zam-

bezia rly. connects Beira with the Nyasaland system (*v.s.*). Area, about 70,000 sq. m.

Zambra, JOSEPH WARREN (1822-97). Anglo-Italian meteorologist. Born in Italy, he was brought to England as a child. In 1850, in partnership with Negretti (*q.v.*), he set up the famous meteorological instrument business on Holborn Viaduct, London. He died at Hampstead Dec. 23, 1897, leaving a large fortune.

Zamenhof, LUDWIG LAZARUS (1859-1917). Polish etymologist, the creator of Esperanto (*q.v.*). Of Jewish parentage, a native of Bialystok, he was by profession an oculist, but is known for his creation of what was designed to be a universal language. He died in Warsaw, April 14, 1917. *Consult* Life, E. Privat, Eng. trans. 1931.

Zamia. Genus of perennial palm-like or fern-like plants of the family Cycadaceae. They are natives of tropical America and the West Indies. The leaves are produced one at a time, and form a crown. In some species they are 8 ft. or more in length. The fruit is in the form of cones.

Zamora. Inland prov. of N.W. Spain, in Leon. It is bounded N. by the Sierra de Peña Negra, and W. by Portugal and the Spanish prov. of Orense. Mainly a hilly plateau, its lowest point is 1,070 ft. alt. In the N.W. is the Sierra de la Culebra, and the prov. is drained by the Douro and its tributaries. In the highlands merino sheep and goats are reared; in the valleys wheat, pulse, vines, and flax are grown. Zamora is the capital. Area, 4,082 sq. m. Pop. 311,450.

Zamora. City of Spain, capital of the prov. of Zamora. It stands on the river Douro, at an alt. of more than 2,000 ft., at the junction of rlys. from Salamanca, Medina del Campo, and Astorga, 31 m. N. of Salamanca. It has an 8th century citadel, a 14th century bridge over the Douro, and several 12th



Zamora, Spain. The cathedral, showing the ruins of the old bridge across the Douro

century churches, including a Romanesque cathedral. It trades in agricultural produce and manufactures linen. During the Peninsular War it suffered severely at the hands of the French, 1808-09. Pop. 18,000.

Zanesville. City of Ohio, U.S.A., the co. seat of Muskingum co. It stands at the confluence of the Licking and Muskingum rivers, 60 m. E. of Columbus, and is served by the Baltimore and Ohio and other rlys. It is one of the chief centres making clay products; glassware, steel goods, and electric transformers are also produced. Coal is mined in the locality. Settled in 1800, Zanesville was the capital of Ohio 1810-12, was incorporated in 1814, and became a city in 1850. Pop. 37,500.

Zangwill, ISRAEL (1864-1926). British novelist. A London Jew, born Feb. 14, 1864, he attended



Israel Zangwill
Russell

London university, and became an elementary school teacher in Spitalfields. The foundation of his literary reputation was his series of masterly studies of Jewish life, of which

Children of the Ghetto, 1892, is best known. His other works include Ghetto Tragedies, 1893; The King of Schnorrers, 1894; The Master, 1895, considered by some his finest work; Ghetto Comedies, 1907; The War for the World, 1917; Chosen Peoples, 1918; Jinny, the Carrier, 1919. Among his plays are Merely Mary Ann, 1903; The Melting Pot, 1908; The War God, 1911; The Next Religion, 1912 (which was banned); Too Much Money, 1918; The Voice of Jerusalem, 1920. Zangwill was founder and first pres. of the international Jewish territorial organization. He died Aug. 1, 1926.

Zante. Italian and more familiar name of the island of Zakynthos. Called the golden island, and third largest of the Ionian Is., it is a department of Greece. Wine, olives, and currants are exported, and carpets manufactured. The chief town, on the E. coast opposite Morea, is also named Zante. Pop., island, 44,750; town, 11,609.

Zanzibar. British protectorate, island, and city off the coast of Tanganyika, E. Africa. The protectorate comprises the islands of Zanzibar and Pemba, and a coastal

strip in Kenya protectorate. The pop. is over 250,000; in round figures there are on Zanzibar Island 150,000, and on Pemba 100,000, or by groups 200,000 Africans, 34,000 Arabs, 16,000 Indians, 250 Europeans.

The island of Zanzibar is situated in lat. 6° S. and long. 39° E. It is separated from the mainland by a channel 22½ m. wide at its narrowest. About 53 m. long by 24 m. wide, it has an area of 640 sq. m., the largest coralline island on the African coast. Pemba lies 35 m. N.E.; it is 42 m. long and 14 m. wide, with an area of 372 sq. m. Features of a tropical climate are extreme heat during monsoon changes, and annual rainfall in Zanzibar of 58-59 ins. and in Pemba of 73-25 ins. Mean temperatures vary from 77° F. in July to 83° F. in Jan.

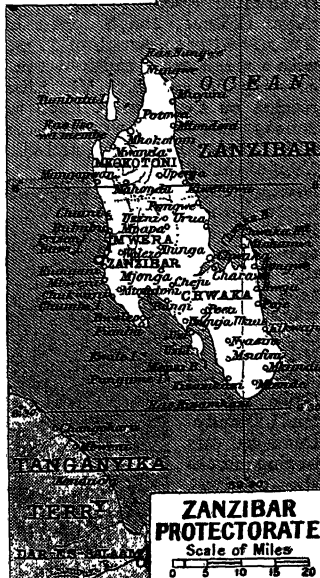
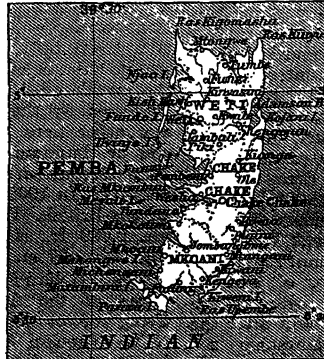
The city of Zanzibar is 25 m. almost due N. of Dar-es-Salaam, on the W. coast of the island, with one of the finest natural harbours in the world, and a pop. est. at 50,000. A fascinating city with an aspect more Oriental

than African, it has narrow, winding, cobbled thoroughfares, also many fine buildings including the sultan's palace on the sea front. The great harbour is now used mostly by coastal vessels. Zanzibar was long the h.q. of the slave trade. The protectorate depends on agricultural products, of which the chief is cloves, introduced in 1830. Four-fifths of the world's supply of cloves normally comes hence, but the "sudden death" virus disease is a continuing menace. Other products are copra, mangrove bark, chillies, citrus, and cacao. There are many cattle, especially in Pemba.

Zanzibar flourished when the Pyramids were being built, for it was the centre of the then known S. hemisphere. Before the Christian era it probably did a steady trade with the Assyrians, Egyptians, Hindus, Greeks, and Arabians. It was practically unknown to Europeans until in 1497 Vasco da Gama sailed round the Cape and incidentally rediscovered it. In 1503 Zanzibar was made subject to Portugal. The first recorded visit of an English ship was in 1591. Zanzibar

was later governed by rulers from Oman on the Persian Gulf, among whom Ahmed bin Said Al-Busaid in 1744 set up the dynasty which has ever since occupied the throne.

In 1856 Zanzibar and the adjacent African territories were declared independent; this included Pemba and a coastal strip some 10 m. wide. In 1890 the islands were declared a British protectorate. The mainland strip was divided, Germany securing the sultan's rights over the portion along the coast of German E. Africa (now Tanganyika Territory), and Italy obtaining control over the portion on the coast of Somaliland. Great Britain paid rent to the sultan for the coast portion of British E. Africa (now Kenya Colony). In 1906 the government of the British protectorate was reorganized, and in 1914 control passed from the foreign to the colonial office; since 1925 administration has been the responsibility of a British resident, who presides over the island's legislative council. In



Zanzibar. Map of the islands off the East African coast, since 1890 a British protectorate

1920 the mainland portion became the Kenya Protectorate. The sultan, Seyyid Sir Khalifa bin Harub (b. 1879), came to the throne in 1911. These are executive and legislative councils.

Bibliography. Zanzibar, Sir R. F. Burton, 1872; Pemba, J. E. E. Craster, 1913; Z., Past and Present, F. B. Pearce, 1920; Z., Its History and Its People, W. H. Ingrams, 1931.

Zanzur. Oasis of Libya, about 9 m. S.W. of Tripoli. The chief products of the region are dates, olives, figs, pomegranates, and almonds. Italians defeated Turkish forces here Sept. 20, 1912.

Zapata, EMILIANO (c. 1880-1918). Mexican bandit. A Guerrero Indian, he organized in 1910 a band of some 1,000 Indians who joined Villa and Madero in the revolt which overthrew Diaz. For seven years he was perhaps the most powerful bandit the world has seen: he led a disciplined force of 20,000, created or controlled the presidents, and held sway over most of the country. Licentious, treacherous, and cruel, he is said to have ordered the execution of 11,000 persons and done damage amounting to £50,000,000. He was finally slain by an officer of President Carranza. Consult The Criminal Jester, H. H. Dunn, 1934.

Zaporozhe. City of Ukraine S.S.R., centre of a region of the same name. A city built after the revolution, and embracing the older Alexandrovsk (pop. 5,000), it lies on the left bank of the Dnieper 125 m. N.W. of Mariupol, and is an important junction of rlys. and waterways. Here in 1932 the great Dnieper Dam (*q.v.*), which traverses the island of Khortitsa, once a famous Cossack settlement, was completed; and here is centred the largest aluminium-producing plant in the U.S.S.R. Power generated in 1947 served more than 2,500 collective farms and some 300 machine and tractor stations, as well as industrial plants over a wide area. The Russians did not defend Zaporozhe during the Second Great War, evacuating it in Aug., 1941, after breaching the dam. The Germans made it the centre of a strong defensive system, the Russians retaking it by storm Oct. 14, 1943, only after a bitter battle in which many Germans were drowned while trying to escape across the Dnieper. Pop. (1939) 289,000.

Zapotec. An American Indian tribe in Oaxaca, Mexico. Numbering some 200,000, they are descended from a people once dom-

inant in Mexico (*q.v.*) before the Spanish conquest.

Zara. Italian name of a seaport of Dalmatia, considered in this work as Zadar (*q.v.*).

Zaragoza. Spanish form of the name of the city of Saragossa (*q.v.*).

Zarathustra. Founder of the religion of ancient Persia and the Parsees, called also Zoroaster (*q.v.*).

Zarephath or **SAREPTA.** Town of Zidon or Sidon (1 Kings 17, v. 9; Luke 4, v. 26). It was on the Mediterranean, between Tyre and Sidon, near the modern Sarafond. Elijah tarried here during a drought, and here took place the miracle of the widow's barrel of meal and cruse of oil.

Zaria. Prov. of N. Nigeria. It is bounded N. by the French colony of the Niger, and lies between the provs. of Sokoto (W.) and Kano (E.). The S.E. is hilly and contains extensive deposits of tin. It is watered by the Kaduna river and its tributaries. Kaduna is near the middle of the prov., which is traversed by the Iddo-Kano rly. and other lines. Zaria, like the rest of Hausaland, fell under the Fula domination in the early 19th century. In 1902 it was occupied by the British. The town of Zaria, alt. 2,090 ft., is situated on the main rly., 97 m. S.W. of Kano.

Zea. Italian and more familiar name of the Aegean island of Ceos, one of the Cyclades group of the Grecian Archipelago. It is situated about 13 m. E. of Cape Colonna, the S. point of Attica, and has a length of 13 m., with a maximum breadth of 8 m., covering 39 sq. m. Mt. Elias reaches an elevation of 1,860 ft. Among the chief products are wine, figs, lemons, cotton, and silk.

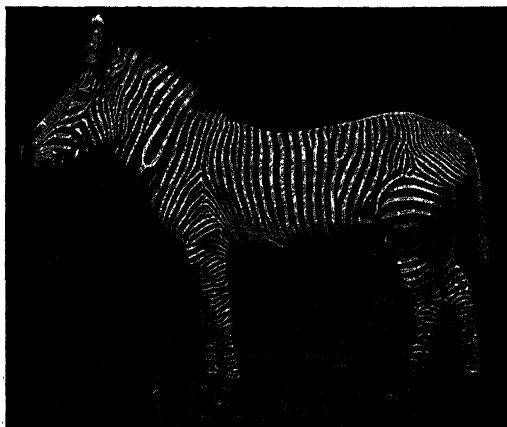
Most of the inhabitants dwell in the town of Zea (the ancient Iulis), in the middle of the island, whose harbour is Port St. Nikolo.

Zealand (Dan. Sjaeland). Island of Denmark containing most of the capital, Copenhagen, and six provinces. Its maximum length from N. to S. is about 80 m., and its greatest

breadth is 66 m., the area being situated between the Great Belt and the Sound, its N.E. part being barely 3 m. from the coast of Sweden. To the N. is the Kattegat, and to the S. are grouped the islands of Laaland or Maribo, Falster, and Møen, which separate Zealand from the Baltic Sea. The coastline is extremely irregular and much indented. The principal openings are Sejerø Bay on the N.W., Ise Fjord on the N., Kjøge Bay on the E., and Faxe Bay on the S.E. The surface is low, nowhere exceeding 400 ft. alt. Chief occupations are dairy farming and horse and cattle rearing. The largest towns besides the capital are Roskilde, Elsinore, Slagelse, Naestved, Holbaek, Korsør. Pop., rather over a million.

Zealots. Jewish sect. It was founded by Judas of Gamala or of Galilee, who led the revolt against the census of Quirinius. Claiming descent from the Maccabees, the Zealots were stern advocates of Mosaic law, bitterly opposed Roman domination, and figured prominently in the great rebellion and the siege of Jerusalem. The term zealot was applied to Simon the Canaanite (A.V.) or Cananaean (R.V.), to distinguish him from Simon Peter (Matt. 10; Mark 3; Luke 6). The term zealot is now used for enthusiast, fanatic, and bigot, according to circumstances.

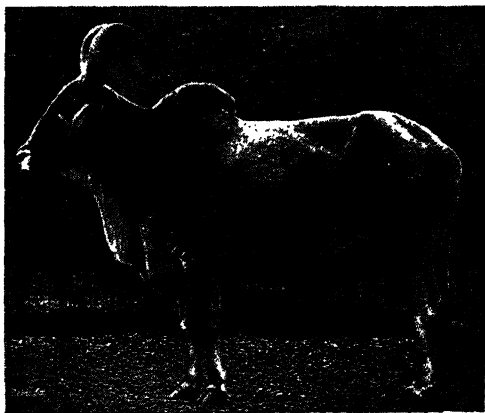
Zebra. Group of animals of the horse family, found only in Africa. They are distinguished by the elaborate black striping on their tawny coats. The common or mountain zebra (*Equus zebra*) occurs in S. Africa, and is heavily and broadly striped. It became almost extinct in Cape Colony once,



Zebra. Grévy's species, distinguished from the common zebra by its larger size and closer stripes. Gambier Bolton, F.Z.S.

but is now increasing under protection. Grévy's zebra occurs in Somaliland and Shoa, and is considerably larger than the mountain species. The ground colour of its pelt is almost white, and the stripes are very narrow and numerous. A rare species, Foa's zebra, confined to the mountains of the Zambezi dist., has many narrow and peculiarly arranged stripes. Burchell's zebra (*E. Burchelli*), found on the S. African plains, resembles the quagga (*q.v.*), and has a tail like that of a horse.

Zebu (*Bos Indicus*). Humped species of horned cattle. They are



Zebu. Domesticated ox, used for draught purposes in India, on account of its immunity from tropical diseases
Gambier Bolton, F.Z.S.

bovine mammals domiciled mostly in the sub-continent of India, but represented by numerous varieties in all tropical countries. They are mainly kept for work, for which they are suitable by reason of ability to withstand the searching influences of the tropical sun, parasites, and infectious diseases, and their wiry frame. The eyes are protected by heavy eyebrows and lids that show the Oriental almond shape. The great majority are whole-coloured, white or grey.

Zechariah. Minor prophet of the Old Testament, contemporary with Haggai. Son of Berechiah, he prophesied from the second to the fourth year of Darius Hystaspis. His first six chapters consist of a series of visions dealing with the circumstances of his own time. The remainder is obscure in meaning and of uncertain date; but it appears to be the work of some anonymous writer shortly after the time of Alexander the Great.

Zechstein. In geology, the upper division of the Permian System (*q.v.*). In England it was a period of desert conditions in-

terrupted by an invasion of the sea from the E. as far as the Pennines, when the Magnesian Limestone series was deposited. In Durham marls with salt, gypsum, and anhydrite were laid down. The German salt and gypsum beds date from this time. In addition there was formed a thin bed of copper-bearing shale.

Zedekiah. Last king of Judah. The youngest son of Josiah, he was placed on the throne in 597 B.C. by Nebuchadrezzar when Jehoiachin was taken captive to Babylon. He was 21 years old when he became king, and his reign lasted for 11 troublous years. Against the warnings and advice of Jeremiah, he joined in an intrigue against the king of Babylon, whose vassal he was, with the result that Jerusalem was stormed and Zedekiah taken captive. His eyes were put out, and he spent the rest of his life as a prisoner at Babylon.

Zedoary (*Curcuma zedoaria*). Perennial herb of the family Zingiberaceae. A native of the Himalayas, it has tuberous roots, and broad leaves which are silky beneath. The yellow tubular flowers are produced in spikes. The tubers are used for making a perfume and as

an aromatic tonic; *C. aromatica* is used for similar purposes. Rhizomes of *C. longa* yield turmeric, an ingredient of curry powder.

Zeebrugge.

Town of Belgium, in the prov. of W. Flanders. It lies on the coast 8 m. by rly. N. of Bruges at the mouth of the canal which links Bruges with the sea. Good harbour facilities, mainly constructed 1895-1907, greatly increased the value of Bruges as a port, and the Zeebrugge mole protecting the harbour curves

crescent-wise for a length of 1½ m. A train ferry service with Harwich was opened in 1924. Zeebrugge played an important part in the First Great War. Here the 3rd British cavalry division landed on Oct. 8, 1914. In German occupation from a week later it became a centre of the coastal defences and a submarine base. It became famous by the British attack of April 23, 1918 (*v.i.*). Captain Fryatt's (*q.v.*) ship, the *Brussels*, was taken into harbour by the Germans in June, 1916, and later sunk by them to block the passage, but was saved by the Allies in 1919. In German occupation in the Second Great War from May, 1940, Zeebrugge was liberated Sept. 10, 1944, by Canadians who here met no opposition.

ZEEBRUGGE ATTACK, 1918. During the First Great War the mole and harbour works of Zeebrugge were constantly bombarded from the sea and air, notably on May 12, 1917. But immense concrete shelters were constructed by the Germans for their submarines, and these gave them a large measure of security. On April 23, 1918 (S. George's day), a successful attack was delivered by a large British naval force under Vice-Admiral R. Keyes, in which the channel leading into the harbour was completely blocked to submarines and destroyers, by three old cruisers filled with cement, which were sunk in it or off the entrance.

To divert the attention of the Germans and the very powerful coast batteries from the blockships, a feature of this attack was a landing from the old cruiser *Vindictive*, and the Mersey ferry-boats *Iris* and *Daffodil*, on the long, curving mole, while a submarine, charged with explosives, was run in under a viaduct which connected the shoreward end of the mole with the coast, so as to blow it up and isolate the German defenders on the mole.

The first of the blockships, *Thetis*, fouled an obstruction near the entrance to the canal and had to be sunk, as she became unmanageable. But the other two, *Intrepid* and *Iphigenia*, pushed into the canal and were so sunk that they prevented all passage for anything larger than a fishing boat. The *Vindictive*, when this work had been accomplished, succeeded in withdrawing with the two ferry-boats, taking with her a quarter of a ton of masonry from the mole which fell on board.

The casualties in this brilliant operation, including an attack on



Zedoary. Aromatic tuberous roots and spike of flowers

Ostend, were light in view of the magnificent service rendered and the extraordinary heroism displayed: 188 officers and men were killed or fatally wounded; 384 were wounded; and 16 were missing. Zeebrugge was sealed up for the rest of the war at this price. The men engaged in the blockships and landing parties were all volunteers. The British loss in ships was 1 destroyer, 2 coastal motor boats, and 2 launches. On April 23, 1925, the king of the Belgians unveiled a memorial on the mole. This is a granite pillar 75 ft. high supporting a figure of S. George.

Zeeland. Prov. of the Netherlands. It lies in the S.W. of the country, on both sides of the Schelde estuary, and consists of the islands of Walcheren, N. Beveland, S. Beveland, Tholen, St. Philipsland, and Schouwen to the N., Zeeland Flanders to the S., of the estuary. It is bordered on the N. by S. Holland, on the E. by N. Brabant, on the S. by Belgium, and on the W. by the North Sea. The low-lying land, much of it reclaimed from the sea, is fertile. Corn, vegetables, particularly chicory, flax, and fruit are grown; stock farming and dairying are important. Middelburg, on Walcheren island, is the capital; and in normal times Flushing, which is connected by a rly. across the islands with Bergen-op-Zoom on the mainland, is an important port. Connexion between Zeeland Flanders and the rest of the Netherlands is by free ferry across the Schelde from Terneuzen to Hoedekenskerke, served by a branch rly. from Goes. Rlys. serving Zeeland Flanders pass through Belgium.

Zeeland became part of the county of Holland in 1256, was one of the 17 provs. of the Low Countries under Charles V, and joined the union of Utrecht in 1579. It was the home of many of the navigators of the great age of exploration, and seafaring and fishing remain among the chief occupations of its hardy people. Its area is 690 sq. m. Pop. 258,510.

During the Second Great War the Dutch army made its last stand in Zeeland Flanders in 1940; and the prov. was the scene of violent fighting in 1944, described under Schelde and Walcheren.

Zeeland, PAUL VAN (b. 1893). Belgian economist and statesman. Born at Soignies, Nov. 11, 1893, he was educated at Louvain and Princeton universities. Professor of law at Louvain, in 1929 he became

economic adviser to the Belgian govt., and paid a visit to Russia. In 1934 van Zeeland was made cabinet minister without portfolio; on March 25 next year premier and minister of foreign affairs in a coalition. This govt. resigned in 1936, but he soon formed a new administration, and presided at the assembly of the League of Nations. In 1937 he successfully fought a bitter by-election in Brussels against the Rexist leader, Léon Degrelle, also securing a vote of confidence in parliament, but resigned on Oct. 25. Van Zeeland undertook at the request of the British and French govts. an international economic mission, publishing his findings in *Economics or Politics*. When the Germans invaded Belgium in May, 1940, he went to Great Britain and worked for refugee organizations. Returning home in 1944, he was appointed Belgian commissioner for repatriation, and elected senator. He was foreign minister Aug., 1949–March, 1950, and from April, 1950.

Zeeman, PIETER (1865–1943). Dutch physicist, born at Zonne-maire, May 25, 1865. At 32 he became lecturer at Leyden, and in 1900 professor of physics at Amsterdam, becoming director of the physical institute there in 1908. Zeeman carried out much research work on the inter-relationship between magnetism and light, discovering what became known as the Zeeman effect (*v.i.*). As a result of this work he shared the Nobel prize for physics in 1902 with Lorentz.

Zeeman Effect. In physics, effect associated with the splitting up of the lines of a line spectrum into definite components when the light source is placed in a strong magnetic field. The nature of the splitting up provides information regarding inter-atomic forces.

Zeerust. Town of Transvaal, S. Africa. It is 149 m. by rly. W.N.W. of Johannesburg, and is situated in the fertile Marico valley, a dist. suitable for fruit growing, rich in minerals, and raising cereals and cotton. The Anglican church is said to be the oldest in Transvaal. Pop. 4,046.

Zeiss, CARL (1816–88). German optician. He was born at Weimar, Sept. 11, 1816, and intended to train as a doctor, but became interested in the science of optics, and in 1846 founded at Jena the business making optical instruments, which, when incorporated in 1889 as Carl Zeiss-Stiftung, had become world-famous for its lenses, binoculars, cameras, etc. He

devoted himself to business almost until his death, Dec. 3, 1888.

Zemstvo. Elective assembly of the former Russian empire. By the constitution established in 1864, district zemstvos, and a provincial zemstvo composed of delegates from all the zemstvos of a province or government, were created. In 1890 their functions were restricted and power passed to the provincial governor. With the introduction of Soviet government, zemstvos disappeared. *See* Russia; Soviet.

Zemun (Ger. Semlin). Former town of Yugoslavia, now part of Belgrade. It is on a tongue of land between the Save and the Danube. Here the Vienna-Istanbul rly. bridges the Save to reach Belgrade. The Germans fought desperately to hold this bridge against the Russians and Yugoslav partisans in Oct., 1944, and it was forced, and Zemun captured, only on the 22nd, two days after the fall of Belgrade. John Hunyadi's castle, in which he died in 1456, is in ruins. Close by is the monument erected in 1896 to commemorate the millennium of the kingdom of Hungary. Zemun was prominent in the First Great War.

Zenana (Persian, *zanana*, from *zan*, woman). Term used for a Hindu harem, *i.e.* for the apartments in which the women of a family are secluded, and also for the women.

Zend. Name usually given to the language of the Zend-Avesta. But as the word *zend* by itself means only commentary, the name Avestic or old Bactrian is preferred. The language belongs to the Iranian group of the Aryan branch of Indo-European.

Zend-Avesta. Name by which the sacred books of the Parsees are known in the West. Correctly, the name should be Avesta and Zend, Law and Commentary. Written originally in Zend, a language allied to Sanskrit, translated into Pahlavi about the 3rd century A.D., and later into Pazend or Parsee, what exists is regarded as a fragment, the rest having been destroyed during the conquests of Alexander, 330–327 B.C., and the Arab invasion of Persia, A.D. 651. Attributed in part to Zoroaster, but as to form and arrangement to about A.D. 230, the work includes a composite liturgical manual for the use of the priests, and hymns, etc. *See* Zoroaster; Zoroastrianism; *consult also* trans., in *Sacred Books of the East*, J. Darmesteter and L. H. Mills, 1880–87; Pahlavi Texts, trans. E. W. West, 1880–97.

Zenith (Old Fr. through old Span. from Arab. *ṣamt*, way). Upper pole of the horizon, the point in the celestial sphere vertically above the observer. It is also defined as the point at which a vertical plumb prolonged upwards meets the celestial sphere. The word commonly denotes an extensive stretch of sky overhead. Magnetic zenith is indicated by the upper end of a needle freely suspended about a horizontal axis. *See* Nadir.

Zenjan OR **ZINJAN**. Town of Persia. The capital of the prov. of Kamsheh, it is about 80 m. S.W. of Resht on the Caspian.

Zeno (b. 490 B.C.). Greek philosopher. He lived at Elea in Italy, and belonged to the Eleatic school (*q.v.*). Friend and associate of Parmenides (*q.v.*), he is chiefly remembered as the author of the famous paradoxes of Achilles and the Tortoise (*q.v.*) and the Arrow (*q.v.*). The discussions provoked by these and similar puzzles proved the beginnings of what is known as the dialectic or question-and-answer method of arriving at a solution of philosophical problems.

Zeno (c. 340-264 B.C.). Greek philosopher, founder of the Stoic school of philosophy, and known as Zeno of Citium, a town in Cyprus. For some years he was a merchant, but having lost his property by shipwreck on a journey to Athens, he settled there and decided to devote himself to philosophy. In succession an adherent of the Cynic, Megarian, and Academic schools, but dissatisfied with each, about 310 he founded a new system and a school of his own at Athens. He opened his school in the Stoa Poikilē (painted porch), and was its president for forty-six years. *See* Stoicism.

Zeno (426-491). East Roman emperor, 479-491. An Isaurian by birth, he became chief of the bodyguard of Leo I, whose daughter Ariadne he married. Their son Leo II, for whom Zeno acted as regent, soon died, and Zeno in 474 was left sole ruler. He was not popular and, through the intrigues of Verina, widow of Leo I, her brother Basiliscus was proclaimed emperor. Zeno fled to Isauria, but the people soon tired of Basiliscus and Zeno was reinstated. During the last part of his reign he was frequently in collision, if not actually at war, with the Ostrogoths of Moesia, but averted the menace by persuading Theodoric the Goth to attack Odoacer in Italy.

Zeno, **APOSTOLO** (1668-1750). Italian poet and historian. He was

born in Venice, Dec. 11, 1668, and became the chief dramatic poet of his time in Italy. In 1710 he assisted in founding the *Giornale dei Letterati d'Italia*, and conducted it until in 1718 he was appointed poet laureate to the court opera and imperial historiographer at Vienna. He wrote and produced 60 operas, besides comic operas for music by Handel and Pergolesi among others; was the author of many shorter poems; and edited Venetian and Latin historians. His dramas were published in ten volumes in 1744. Zeno died Nov. 11, 1750.

Zeno, **NICCOLO** (fl. 1375-91). Venetian navigator. He and his brother Antonio visited Greenland, and on the return journey found land which people have attempted to identify as New England, Labrador, or Newfoundland. An account of their voyages was published in Venice, 1558.

Zenobia. Queen of Palmyra, 267-272. Famed for beauty and strength of character, she was the wife of Odenathus (*q.v.*), and after his assassination became regent for her son, Vaballath, choosing as her ministers the Greek rhetorician Longinus and Paul of Samosata, bishop of Antioch. Her ambition was to carve an empire out of the Roman dominions in the East; and while Claudius II was repelling an invasion of the Goths, she occupied Egypt, and after Aurelian had been defeated by the Goths, she proclaimed her son Augustus. Aurelian marched against Zenobia, defeated her at Emesa, and took Palmyra, 272. The queen was taken prisoner, but Aurelian spared her life, and after granting his triumph she spent her remaining years in retirement at Tibur. *See* Palmyra.

Zenta. Hungarian, more familiar form of the name of the Yugoslav town Senta. It stands on the right bank of the Tisza (Theiss), 33 m. by rly. S. of Szeged. Pop. 31,969. Zenta is famous for the battle fought Sept. 11, 1697, between the emperor's troops under Prince Eugene and the Turks. Each side is said to have numbered about 100,000 men, and after a hard struggle the Turkish army, with which the sultan was present, was virtually destroyed.

Zeolite. The name given to a family of minerals. They are hydrated silicates of calcium and aluminium, sometimes with sodium and potassium. The members of the group include analcite, apophyllite, chabazite, prehnite, stilbite, natrolite, and others. They

generally result from the secondary alteration of feldspars and aluminous minerals of igneous rocks, but may also be deposited from the watery solutions emanating during the later stages of the cooling down of igneous magmas; then they are often connected with ore deposits. Zeolite minerals are generally found filling cracks and cavities in basalts, etc., also as a gangue in some veins.

Zephaniah. Minor O.T. prophet active in the days of King Josiah. A son of Cushi, he was probably of the royal house. His short book has been described as a compendium of prophecy, dealing first with universal judgement for sin, and then briefly with universal salvation.

Zephyrus. In Greek mythology, the personification of the west wind. He was a son of Eos, the dawn, and was regarded as beneficent to sailors, as opposed to such violent winds as Aquilo, the N.E. wind. *See* Venti.

Zeppelin, **FERDINAND**, **COUNT VON** (1838-1917). German airship designer. Born at Constance,



Count Zeppelin, German airship designer

July 8, 1838, he was educated at Stuttgart for the army and joined it at 20. In 1863 he fought in the American Civil War on the Union side. Returning to Germany, he saw active service in

the wars of 1866 and 1870-71. Retiring from the army as general in 1891, he devoted the remainder of his life to aeronautics. In 1899 he formed a company and built his first floating airship dock. For some years he continued airship construction until in 1906 he made a successful flight of 60 m. in two hours. The German govt. then came to Zeppelin's help, and in 1908 his first airship passed the government's tests, but was wrecked. Many rigid airships of this class were later built at Friedrichshafen. Zeppelin had envisaged the use of airships in war for reconnaissance but not for attack. They were, however, used by the Germans in the First Great War in bombing expeditions against the U.K., where their inventor's name became a household word in consequence. Zeppelin died March 8, 1917. *See* Air Raids; Airship; Eckener; Graf Zeppelin; Hindenburg. *Consult* Z., the Man and His Work, H. Eckener, Eng. trans. 1938.

Zerafshan OR KARA-DARIA. River of Soviet Central Asia. Rising in the mts. of Zerafshan, Tadzhik S.S.R., it flows W. into Uzbek S.S.R., through Samarkand, passes Bokhara on the W., and loses itself in the sand near the Amu-Daria (Oxus), after a course of 470 m.

Zerbst. Town of Saxony-Anhalt, E. Germany, on the Nuthe, 22 m. S.E. of Magdeburg. The chief buildings are the church of S. Nicholas and the town hall, both of the 15th century. The buildings of three religious houses still stand, but all are used for secular purposes. The palace, once the residence of the princes of Anhalt-Zerbst, contains the archives. The town retains parts of its walls, has some picturesque old houses, and in its market-place a bronze figure known as the butter girl, and a Roland column. Machinery, beer, soap, starch, and chemicals are manufactured. Zerbst was a flourishing town in the Middle Ages. It has belonged to Anhalt since 1307, and during 1603-1793 was the capital of the little state of Anhalt-Zerbst. Overrun at the end of April, 1945, by the U.S. 9th army, it came after the surrender of Germany within the Russian zone of occupation. Pop. 24,000.

Zermatt. Village and tourist centre of Switzerland. In the canton of Valais, it stands in a valley surrounded by mountains, at an alt. of 5,315 ft., 22 m. by rly. S. by W. of Visp. Near the base of the Matterhorn and the beautiful Monte Rosa, it is the starting point of the rly. to the Gornergrat (*q.v.*), on the route over the Théodule Pass to Val Tournanche in Italy. Pop. 1,200.

Zero. Mathematical symbol which signifies the absence of quantity or number. It is written 0, and its appearance as a printed symbol is not known before the 7th or 8th century, although it was probably introduced into Hindu mathematics as early as the 5th century. In thermometry it is used as one of the fixed points of temperature.

Zero, ABSOLUTE. In physics, a temperature of -273.13°C. , at which a body would possess no heat energy. At this temperature the molecules of a gas would theoretically exert no pressure on the sides of a containing vessel; but in practice all gases become liquids or even solids at temperatures above this. Absolute zero has not been reached, but Onnes arrived within 3° of it

by allowing liquefied helium to boil, and W. F. Giauque reached as low as $0.05^{\circ}\text{Kelvin}$ by adiabatic magnetisation. *See* Heat.

Zero Hour. Military term to denote the precise, prearranged time for a troop movement, particularly the launching of an attack and of the relevant artillery barrage, extensively used during the First Great War. *See* D-day.

Zeser, ZOSER, OR TCHESER (*fl.* 2960 B.C.). Egyptian ruler. Son of Khasekhemui, he was the second king of the IIIrd dynasty. During his prosperous reign the boundaries of Egypt were extended above the first cataract of the Nile. Besides many temples he built the earliest pyramid, that of stone at Sakkara (*q.v.*).

Zetland, MARQUESS OF. British title borne since 1892 by the family of Dundas. In 1762 Lawrence Dundas (d. 1781), a contractor to the army and M.P., was made a baronet. The family obtained estates in Shetland, and Sir Thomas (1741-1820), the 2nd baronet, was lord-lieutenant of Orkney and Shetland. In 1794 he was made a peer as Baron Dundas, and his son Lawrence (1766-1839) was made earl of Zetland in 1838, this being a variant spelling of Shetland. From him was descended Lawrence (1844-1929), 3rd earl, who during 1889-92 was lord-lieutenant of Ireland, being made a marquess on his retirement. The 2nd marquess has a separate entry (*v.i.*). The eldest son of this peer is called earl of Ronaldshay.

Zetland, LAWRENCE JOHN LUMLEY DUNDAS, 2ND MARQUESS OF (b. 1876). British politician and author. Born June 11, 1876, son of the 1st marquess, and educated

at Harrow and Trinity College, Cambridge, he travelled widely in the Far East, visiting India, where in 1900, as earl of Ronaldshay, he was aide-de-camp to the viceroy; also Persia, Siberia, Japan, and China. The results of his observations were chronicled in several vols., *e.g.* On the Outskirts of Empire in Asia, 1904; An Eastern Miscellany, 1911. He was Unionist M.P. for Hornsey, 1907-16, and governor of Bengal, 1917-22.

Succeeding to the marquessate in 1929, he served on the Indian round table conference and parl. committee. Baldwin made him secretary for India in 1935, and during 1937-40 he combined the office with that of secretary for Burma. He was president of the Royal Geographical society, 1922-25; Royal Asiatic society, 1928-31; then until 1945 chairman of the National Trust. His next post was lord-lieut. of the N. Riding. In 1942 Zetland received the Garter. He published several more books on Asia, and produced the official Lives of Curzon (1928) and Cromer (1932). He brought out an ed. of Disraeli's letters in 1929.

Zeugen. In geology, a type of rock-table found in deserts. It is the product of wind erosion acting on horizontal strata where residual remnants of a hard bed protect and stand above the general level of more easily eroded rocks. The flat zeugen become undercut by wind action, and eventually the hard rock cap tips over. Zeugen may be up to 150 ft. in height.

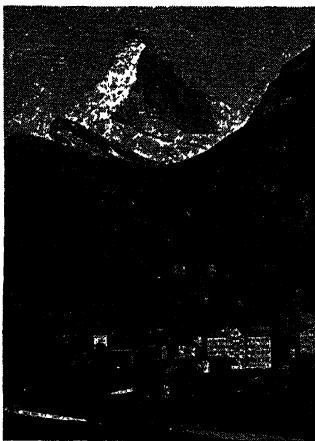
Zeuglodonts (Gr. *zeuglō*, strap of a yoke; *odont*, tooth). Extinct fossil whale found in the Eocene deposits. The earliest known cetacean, it reached a length of 70 ft., with a long narrow skull and a long body and tail. It swam by means of paddles or flappers.

Zeugma (Gr. *zeugnynai*, to join). Figure of speech, by which one word, especially a verb, is used in connexion with two words or clauses, although it is strictly applicable only to one, a kindred idea being mentally supplied for the other. A famous example is in Pope: *See Pan with flocks, with fruits Pomona crowned.*

Zeus. In Greek mythology, the supreme god, identified by the Romans with Jupiter (*q.v.*).



2nd Marquess of Zetland



Zermatt, Switzerland. The famous tourist centre at the foot of the Matterhorn

Of common Indo-European origin, the name, which means shining, i.e. the sky, is identical with Skt. Dyaus, Lat. Jupiter, and A.-S. Tiw. A god of the weather, especially thunder and rain, Zeus was associated with Thessaly, especially Mt. Olympus. His chief shrine and oracle were at Dodona, where the oak was sacred to him. Son of Cronos (*q.v.*) and Rhea, he dethroned his father, and overthrew the Titans (*q.v.*) and Gigantes (*q.v.*). His chief consort was Hera (*q.v.*), and among his many children were Artemis and Apollo. Zeus was father of the human race. See Olympus.

Zgorzelec. Polish name of the city of Silesia historically known by German name of Görlitz (*q.v.*).

Zhdanov. New name of the Ukrainian seaport more familiar as Mariupol (*q.v.*), given in honour of the politician Zhdanov (*v.i.*), who was born there.

Zhdanov, ANDREI ALEXANDROVITCH (1896-1948). Russian politician. Born at Mariupol, he was the son of a school inspector, and joined the Bolshevik party in 1915. After holding party posts in the Tver and Gorki districts, he succeeded the murdered Kirov as party leader in Leningrad in 1934. In 1938 he was appointed president of the Soviet foreign affairs commission, and as such was a bitter critic of Litvinov. He was appointed secretary of the central committee of the Communist party in 1940, taking charge of propaganda. In the Second Great War Zhdanov was chairman of the Leningrad defence council, and received the rank of colonel-general. In 1944 he became president of the supreme soviet of the R.S.F.S.R., and in 1946 secretary of the Russian Communist party. He signed the Russo-Finnish armistice in Sept., 1944, and until 1947 was chairman of the Allied control commission in Finland.

Zhdanov was one of the chief architects of the Soviet policy of territorial and economic expansion through the creation of satellite states. He was strongly opposed to any compromise with the western powers, and at the founding of the Cominform in 1947 he accused the U.S.A., the U.K., and France of imperialistic aims. He died suddenly in Moscow on

Aug. 31, 1948, and was buried at the foot of the Kremlin wall in Red Square, Moscow.

Zhitomir. Town of Ukraine S.S.R., capital of a region of the same name. The town lies on the Tetenev, a trib. of the Pripiet, 80 m. W. of Kiev. First mentioned in 1240, it went to Lithuania in 1320, became the capital of the dist. of Kiev in 1686, and in 1778 was united to Russia. Before the Second Great War it had a pop. of 95,090, including a number of Jews. With 19 Orthodox and three R.C. churches, two synagogues, a Hebrew theatre, and a Jewish printing works where most of the Hebrew books published in Russia were printed, it was a centre of Jewish culture; it had also some manufactures. It is a railway and road junction of some importance. The Germans captured it during July, 1941, after more than a week of fierce fighting. Infantry and Cossack cavalry of Vatutin's 1st Ukrainian army seized it during the night of Nov. 12-13, 1943, by this victory driving a wedge between the German armies to the N. and S. Manstein, however, forced the Russians to evacuate the town again six days later. Vatutin's recapture of Zhitomir by assault on Dec. 31 was the signal for a mass flight of the German and Rumanian "colonists" whom the Germans had introduced into the Ukraine. *Pron.* Jitomir, sometimes used in English as a translation of the name.

Zhob. River and district of Baluchistan, Pakistan. The Zhob river has a northern course of about 120 m., and joins the Gomul near Khajuri Kach, on the borders of Waziristan. Area, 10,478 sq.m. The pop. of 61,499 consists mostly of Pathans.

Zhukov, GREGORI KONSTANTINOVICH (b. 1895). A Russian soldier. Joining the tsarist army



G. K. Zhukov,
Russian soldier

as a private in 1915, he served on the E. front until the Revolution of 1917, when he was commissioned in the Red army and fought against Poland. In 1922 he entered Frunze military academy, and earned distinction for studies in defensive strategy against mechanised troops. In 1938-39 he served against Japanese forces on the Amur. Named chief of the

general staff and vice-commissar for defence in Feb., 1941, Zhukov was made responsible for Moscow's defence after Marshal Timoshenko was transferred to the S. sector. In Dec. his armies launched a series of attacks which drove the Germans back. He planned and initiated the counter-offensive at Stalingrad, and in Jan., 1943, coordinated forces for raising the siege of Leningrad.

On March 5, 1944, Zhukov took over command of the 1st Ukrainian army, and launched the offensive which carried his troops to the borders of Czecho-Slovakia. Early next year he led the 1st White Russian army in the advance on Berlin. Appointed marshal of the Soviet Union May 1, 1945, he signed for the Russians the ratification in Berlin on May 8 of Germany's surrender. As commander of the Russian occupying forces in Germany, he represented Russia on the Allied control council until recalled to Moscow in April, 1946, to become for a time c.-in.-c. land forces and deputy minister of armed forces.

Ziani. Name of an ancient Venetian family. Sebastiano, elected doge in 1172, played an important part in the peace negotiations between Barbarossa and Pope Alexander III. He also set the finances of the republic in order and instituted the ceremony of the Wedding of Venice with the Adriatic. His son, Pietro, succeeded Dandolo as doge, 1205-29.

Ziegfeld, FLORENZ (1869-1932). American theatrical producer.

Born in Chicago, March 21, 1869, he became a showman at its world fair, 1893, and three years later brought to the U.S.A.



Florenz Ziegfeld,
American theatrical
producer

Anna Held, a French music hall singer, whom he married and starred in musical plays. In 1907

he produced the first of the famous Ziegfeld Follies revues in New York, and spent vast sums on "glorifying the American girl" in lavish and spectacular entertainments. One of his most successful productions was Show Boat, at the Ziegfeld Theatre, New York, 1927. He died July 22, 1932. A film, The Great Ziegfeld, appeared in 1937, William Powell playing the lead.

Ziggurat. Temple-tower constructed in diminishing stages, in Babylonia and Assyria. The word

means a high place. The external ascent, usually spiral, was sometimes an upright stairway from terrace to terrace. See Babylon col. plate, f.p. 833; Ur.

Zimbabwe (Karanga, houses of stone). Bantu name for various ancient stone strongholds, especially in S. Rhodesia. Great Zimbabwe denoted three adjacent groups of ruins 17 m. S.E. of Victoria. Explored by Bent in 1891, they were found to comprise an irregular oval, 831 ft. in circuit, enclosed by a wall of unmortared granite blocks, in parts 31 ft. high and 15 ft. thick at the base. An inner parallel wall 190 ft. long forms a narrow passage from one entrance to a confined area containing a solid conical tower 31 ft. high and 57 ft. round the base. Within the ruins were found steatite carvings, especially of hawk-like birds, bowls, phallic emblems, crucibles, an ingot-mould of an old Phoenician type, and gold objects. Probably the structures were erected under the influence of Arabian gold seekers.

Zimisces (925-976). East Roman emperor, 969-976, otherwise known as John I (Zimisces). He was a native of Cappadocia. Succeeding his uncle, Nicephorus Phocas, whom he murdered, he drove the Russians out of Bulgaria, which, except in the west, became the vassal of Byzantium. Part of Syria was recovered from the Abbasides, and campaigns on the Tigris and Euphrates checked the onset of Islam. *Prov.* Tsimis-keez.

Zinc and Zinc Ores. The metallic element zinc (chemical symbol Zn) falls into the 4th group of the periodic table of elements, its neighbours being magnesium and cadmium, to which it bears similarity. The atomic no. is 30; atomic weight, 65.38; density, 7.1 gm per c.c.; electrical resistivity 6.1 ohm cm; melting point, 419.5° C.; boiling point, 913° C.; crystal structure, close-packed hexagonal, with a large axial ratio $c/a=1.8563$ and inter-atomic distances of 2.6595 and 2.9070 Å.U. at 25° C.

Zinc occurs in nature chiefly as the sulphide, zinc blende or sphalerite, ZnS , and the carbonate smithsonite (calamine), $ZnCO_3$. Blende is commonly contaminated with other sulphides, such as iron or copper pyrites, and it is often associated with lead sulphide, galena. These mixed ores sometimes contain sufficient silver to render its extraction profitable. Other minerals which occur, usually only in association with

blende or calamine, but occasionally as independent sources of zinc, are the two silicates, hemimorphite, $Zn_2SiO_4 \cdot xH_2O$ and willemite, Zn_2SiO_4 . The famous Broken Hill ore, so called because of its occurrence on a vast scale at Broken Hill, N.S.W., Australia, is an intimate mixture of zinc blende and galena with a variable composition, containing up to 20 oz. silver per ton.

World production of zinc exceeds 1,800,000 tons per year, the largest contributors being the British Commonwealth and the U.S.A., the former producing about 20 p.c., the latter 40 p.c. of the world's total. In the British Commonwealth, the bulk comes from Australia and Canada. Other important producers are Mexico and European countries, among which Germany and Austria yielded 12 p.c. before the Second Great War. The U.S.S.R. produces less than 7 p.c. of the world's total. In the U.K. output from Derbyshire and N. Wales has now almost ended.

There are two principal methods for extracting zinc from its ores, distillation, and electrolysis after leaching. The electrolytic process has gained in popularity, largely because of high purity of the product. The metal from this and from the vertical retort process often exceeds 99.99 p.c. zinc. Considerable amounts of zinc are now recovered by the smelting of zinciferous lead slags, produced during the smelting of the lead concentrates from mixed ores. This is carried out in special furnaces and often electro-thermal methods are used.

PROPERTIES AND USES. Pure zinc (or "spelter" as the metal is termed commercially) is white, with a slightly bluish tinge. It can be readily polished, and a freshly broken surface shows a high metallic lustre. The metal is a poor conductor of heat and of electricity, and it is so soft that it can be easily marked with a knife, but at ordinary temperatures it is not malleable or ductile. At slightly elevated temperatures of about 150° C. it can be easily rolled or drawn into wire, which may have a tensile strength up to 8 tons per sq. in., compared with 2-3 tons per sq. in. for the cast metal. Zinc has a high resistance to corrosion by the atmosphere, and it is this property which largely accounts for its wide use in modern industry. Galvanised sheet and wire are familiar all over the world, accounting for half of the world's zinc, and zinc sheet is being

used increasingly. Zinc plating is replacing cadmium in many plants because of its lower cost.

In the alloy field, zinc is widely applied. Brass, which normally contains between 30 and 40 p.c. zinc, has been cast in the U.K. since 1693. The pressure die-casting industry has been founded on the zinc-base alloys of the "Mazak" type. These alloys contain varying amounts of magnesium, aluminium, zinc, and copper. These are used for mass-produced articles, e.g. door handles, often being electroplated with chromium or nickel. A motor car contains many die-cast parts.

Zinc dust is used in the chemical industries as a reducing agent and in the extraction of gold for the precipitation of metallic gold from cyanide solutions. Zinc oxide is widely used as a pigment by painters because of its pure white colour and protective qualities; and the sulphide, with that of barium, is the pigment lithopone. Certain zinc salts are used in medicine and dentistry, and they also serve as mordants in dyeing processes, as wood preservatives, and disinfectants.

HISTORY. Although the Romans used zinc in brass, it is almost certain that they were not familiar with it as an individual metal. Probably the Chinese separated metallic zinc from its ores many years earlier, but in Europe it was first mentioned as a metal by the alchemist Paracelsus (c. 1492-1541), and at about the same time by Georgius Agricola: but neither describes a method of smelting zinc. At the beginning of the 18th century an Englishman visited China to learn the secret of zinc extraction, and shortly afterwards a plant was started at Bristol for the production by distillation *per descensum*. Further plant was later built at Swansea and Llanelli, which remained the centre of the British zinc industry for many years. In Belgium and Germany the more economical method of zinc distillation *per ascensum* was preferred, and these methods are the basis of many of the modern processes. See Brass; Condensation; Distillation; Electrolysis; Flotation; Roasting; Sintering. For zinc blende, see Sphalerite.

Zincite. Mineral composed of zinc oxide with traces of manganese up to 12 p.c. It occurs as reddish masses or grains associated with franklinite, willemite, and calcite, and is common in the pyrometamorphic zinc deposits at Franklin Furnace, N.J.

Zincography. Process of placing designs for printing purposes on zinc plates, and of producing impressions therefrom. The process is in principle the same as lithography, the zinc taking the place of the stone; it is described under Process Engraving.

Zinc White. Alternative name for the pigment commonly known as Chinese White (*q.v.*).

Zinder. Town in the Niger colony, French West Africa. It was occupied in 1899 and was capital of the colony until 1926, when it was superseded by Niamey. Lying about 130 m. N.E. of Kano in Nigeria, it is a centre of motor roads and of trade, having strong walls pierced with gates. In the vicinity horses, sheep, and camels are bred. Pop. 6,000.

Zinkeisen. Name of two sisters, British designers. Anna Katrina was born at Kilcreggan, Dumbartonshire, Aug. 28, 1901, studied art in London, and early exhibited at the R.A. and Paris Salon. She made her reputation with posters and her semi-stylised compositions had an influence on commercial art. Doris Clare, also Scottish-born, was a successful theatrical designer, her lavish and fantastic style being at its best in productions of *The Insect Play*, 1923; *The Way of the World*, 1924; many Cochran revues; *Nymph Errant*, 1933; *Richard III*, 1944; and the ballets *Giselle*, *The Sleeping Princess*, and *Twelfth Night*.

Zinnia. Small genus of annual and perennial herbs of the family Compositae. Natives of Central America, they have opposite, undivided leaves, and brightly coloured flower-heads. *Z. elegans*, from which most of the garden varieties have been derived, is an annual, with flower-heads ranging in colour from white to scarlet.

Zinoviev, GEORGEI (1883-1936). Name adopted by Radomilsky Apfelbaum, a Russian politician of Jewish parentage. He was born at Elisavetgrad (the name of which was changed to Zinovievsk in 1924) in Sept., 1883, and joined the revolutionary movement as a young man, becoming a leader of the exiled revolutionaries in Berne, where he studied law. Back in Russia, he was active in the revolution of 1905, and had to flee the country again in 1908. He spent

much of the next few years in Switzerland, where he became the chief lieutenant of Lenin, with whom he returned to Russia in 1917 in the sealed rly. coach authorised by the Germans. As president of the St. Petersburg soviet, he enjoyed great power in the new regime, and in 1919 became president of the committee of the third (Communist) international. The so-called Zinoviev letter, published in the press on the eve of the general election in the U.K. in 1924, which represented him as calling on English Socialists and Communists to rebel, was thought to have helped in the defeat of the (minority) Labour govt. at the polls. After Lenin's death in 1924, Zinoviev was at first a supporter of Stalin, but his association with Trotsky led to his expulsion from the Communist party in 1926. He was reinstated in a minor post three years later, but in 1935 was sentenced to 10 years' imprisonment for "moral responsibility" for the murder in Dec., 1934, of Kirov, head of the Leningrad Communist party; and on Aug. 18, 1936, was charged with helping in 1932 to form a terrorist organization aimed at the assassination of Stalin and others. Condemned on Aug. 24, he was shot next day.

Zinzendorf, NICOLAUS LUDWIG, COUNT VON (1700-60). Reorganizer of the Moravian Church. He was born at Dresden, May 26, 1700, and went into the Saxon state church, but soon settled on his estate in Lusatia and gathered a community based on quietist principles. In 1722 he founded for persecuted Moravians a settlement at Herrnhut, for which he was banished by the king of Saxony in 1736. He became bishop of the Moravians in 1737 and then travelled widely in Europe, visiting London and America, preaching and organizing Moravian churches and missions till in 1748 he was allowed to return to Saxony. He died at Herrnhut, May 9, 1760. Zinzendorf wrote mystical works both in prose and verse, and

numbers of his hymns survive. His autobiography, in diary form, was published in 1907. See *Moravians*.

Zion, MOUNT. One of the hills upon which Jerusalem was built. It was immediately S. of Mt. Moriah on which the Temple stood, and was called the City of David. The name Zion is sometimes used in a general sense for Jerusalem.

Zion City. Village of Illinois, U.S.A., in Lake co. It stands on Lake Michigan, 43 m. N. by W. of Chicago, and is served by rly. It was founded in 1901 by John Dowie (*q.v.*), as a market-gardening and dairying colony under the Christian Catholic Apostolic Church. Pop. 3,101.

Zionism. A Jewish movement for the reestablishment of Jewish national life in Palestine. Deriving from the Friends of Zion, founded in Russia c 1870, and the Jewish agricultural colonies established in Palestine from 1882, the movement found expression in 1895 in a book, *Der Judenstadt*, 1895, by Theodor Herzl (Eng. translation *The Jewish State*, 1896). Herzl and Max Nordau convoked the first Zionist congress, 1897, at Basel. This empowered Herzl to negotiate with the Sublime Porte for the grant of an autonomous state under Turkish suzerainty. Two interviews with Sultan Abdul Hamid had no results, and the British govt. was approached.

The Sinai peninsula, considered first, was dropped as too waterless; then on Joseph Chamberlain's initiative, Uganda was suggested. This proposal was rejected thrice at Zionist congresses. Zangwill founded the International Jewish Territorial Organization (ITO) willing to accept the E. African solution. Meanwhile pogroms in Russia were accelerating Jewish immigration into Palestine.

In 1908 a Zionist agency was created at Jaffa, and in 1909 the first Zionist settlement was established at Daganiah on the Jordan, and the first Jewish town, Tel Aviv, was founded. When the First Great War broke out, about 95,000 Jews were living in Palestine; most of them were expelled by the Turks, but ten years later their numbers had grown again. During that war Chaim Weizmann of Manchester won Balfour over to the Zionist aims, which were embodied in the so-called Balfour Declaration (*q.v.*) of Nov. 2, 1917, and confirmed in the mandate for Palestine granted to the U.K. Conflicts between Jews and the Arabs of Palestine, not unnaturally opposed to Zionist aims, caused the British



Zinnia. Brightly coloured flower-heads and leaves



Count Zinzendorf, Moravian leader

in 1921 to limit Jewish immigration.

The subsequent history of Zionism dovetails into that of Palestine (*q.v.*). With funds collected from Zionists and other Jews everywhere, but particularly in the U.S.A., Zionism assisted the settlement of Jewish immigrants in Palestine and the development of local industry and of culture, *e.g.* by the creation of the Jewish university of Jerusalem, 1925. The Zionist congress elected an executive body and a president who was simultaneously president of the Jewish agency, which from 1929 embraced non-Zionist Jews also and eventually produced the provisional govt. of the state of Israel, proclaimed May 14, 1948. See Herzl, T.; Nordau, M.; Palestine; Weizmann, C. *Consult* History of Zionism, N. Sokolow, 2 vols., 1919; Zionism, L. Stein, 1932; Why a Jewish State? L. J. Feuer, 1942; The Birth of Israel, J. Garcia-Granados, 1948; Trial and Error, C. Weizmann, 1949.

"Zip." Patent name for a device of which the principle is explained under Slide Fastener.

Zipaquira. Town of Colombia, in the dept. of Cundinamarca, about 30 m. N. of Bogota and connected with that city by the Del Norte rly. Rock salt is mined from deposits hundreds of feet thick, said to be sufficient to supply the world for centuries. Here is a govt. caustic soda plant. Zipaquira lies in a notable cattle-raising district. Pop. 12,200.

Zipporah. Wife of Moses. Daughter of Jethro (Exod. 2), she married the patriarch in Midian, and bore him two sons, Gershom and Eliezer. Later she returned to her father, but rejoined Moses in the wilderness (Exod. 18).

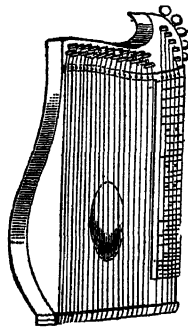
Zircon. In mineralogy, zirconium silicate, $ZrSiO_4$. Occurring as colourless to reddish-brown tetragonal crystals or grains, it is common as an accessory constituent of acid igneous rocks and pegmatites; also in certain metamorphic rocks. The source of the metal zirconium, it is worked from pegmatites in Madagascar, Brazil, and elsewhere; also from placer deposits in Ceylon, Burma, India, and the U.S.A., where it is frequently associated with ilmenite, rutile, and monazite. Zircon has a high refractive index, an adamantine lustre, and is hard; flawless stones of good colour are therefore prized as gems. Gem varieties include hyacinth, red, and transparent; while jargoon is colourless and smoky.

Zirconium. One of the chemical elements. Its symbol is Zr; atomic number 40; atomic weight 91.22; density 6.5 gm per c.c.; melting point $1,857^\circ\text{C}$; boiling point about $2,900^\circ\text{C}$. It has cubic and hexagonal structures. Zirconium is found chiefly as the silicate zircon (*v.s.*) or the oxide baddeleyite, ZrO_2 . New South Wales produces the largest amount of zircon; most baddeleyite comes from Ceylon and Brazil. Either ore may be obtained in solution by fusion, or baddeleyite may be dissolved in concentrated sulphuric acid under pressure. Owing to the iron and silicates present, many stages are necessary to obtain pure zirconium. Powdered zirconium is inflammable, and will combine with hydrogen, nitrogen, and the halogens. The metal is only slowly attacked by most acids. The common oxide is zirconia, ZrO_2 , a white, highly refractory solid, dissolving in acids to give salts and in fused alkalis to give zirconates.

Zirconium is used for alloying; the addition of 0.7 p.c. to copper doubles the tensile strength, while the addition to magnesium refines the grain and increases resistance to corrosion. Some ferro- and silico-zirconium has been used in steel. The most important commercial compound is the oxide which, melting at $2,700^\circ\text{C}$, is used in ceramics and as refractory linings for furnaces.

Ziska or **Žižka**, JOHN (c. 1360–1424). Bohemian soldier. Born at Trocnov, he was brought up as a page in the palace of King Wenceslas, and then served as a soldier of fortune in the German, Hungarian, and English armies. Returning to Bohemia in 1419, he turned the Hussite army into a disciplined host, his followers being called Taborites. He defeated the Germans at Prague, 1420, and though blinded next year, won many more battles, notably in 1422 at Deutsch Brod. Ziska marred his victories by ruthless methods against priests and monks, but he united the Hussite reformers, and was preparing to attack Moravia when he died, Oct. 11, 1424.

Zither. Musial stringed instrument. Popular in the highlands of Bavaria, Styria, and Tirol, it is a shallow box about 20 ins. long, 10 ins. wide, and 3 ins. deep, and having a round opening in the upper sound-board. The shape is not an exact oblong, as frequently one or both of the sides bulge so as to amplify the resonance. The strings fall into three categories:



Zither. Stringed musical instrument of Central Europe

(1) five melody strings of wire tuned like the viola (*q.v.*), but having the A duplicated; (2) a varying number of accompaniment strings of gut; and (3) twelve bass strings, an octave lower in pitch than the accompaniment strings on the

side farthest from the player. The accompaniment strings provide a complete chromatic scale; they are not, however, arranged in semitonic order, but in fifths and fourths. This principle facilitates the playing of chords.

Zittau. Town of Saxony, E. Germany, on the left bank of the Neisse. One of the earliest German settlements in this formerly Slavonic land, a town since 1255, it contains the churches of Our Lady (13th century), SS. Peter and Paul, a former abbey church (14th century), and S. John (rebuilt 1834–37), and secular buildings of 16th to 17th century origin. It has parks, libraries, and high schools, is a rly. junction, and, in pleasant, hilly surroundings, was an attractive residential town before the Second Great War. Besides a textile industry, there were chemical, metal, and engineering plants based upon the nearby lignite mines. Overrun by the Russians during April, 1945, it lay in the Russian zone of occupation after the surrender of Germany. Pop. 45,000.

Zoar. One of the five cities of the Plain. It was situated near the shores of the Dead Sea. At the destruction of Sodom and Gomorrah, it was spared as a refuge for Lot (Gen. 18).

Zodiac. In astronomy, a belt of the sky 16° wide containing the apparent paths of the sun, moon, and chief planets. The name is derived from the Greek *zōdion*, little figure. The zodiac was divided into twelve signs of 30° each. All these signs have their own names and symbols and are as follows, the English equivalents of the Latin names being given in brackets: Aries (Ram) ♈; Taurus (Bull) ♉; Gemini (Twins) ♊; Cancer (Crab) ♋; Leo (Lion) ♌; Virgo (Virgin) ♍; Libra (Balance) ♎; Scorpio (Scorpion) ♏; Sagittarius (Archer) ♐; Capricornus (Goat) ♑;

Aquarius (Water Bearer) ♒; Pisces (Fishes) ♓. The first six of these signs are N. of the celestial equator and the remainder S.



Zodiac. Representation of the signs of the zodiac, from a 16th century MS

The line of intersection of the planes of the ecliptic and the celestial sphere at two points known as the equinoctial points, and from these the positions of stars are calculated. The point at which the sun crosses the equinoctial from S. to N. is called the first point of Aries or the vernal equinox, Libra being the corresponding point, the autumnal equinox. The ancients supposed that the equinoctial points were fixed, but they are slowly moving, taking nearly 26,000 years to make a complete circuit of the heavens, and the signs no longer correspond to the constellations, e.g. the sign of Aries is now in Pisces.

The zodiac is Babylonian in origin (c. 2000 B.C.), and was adopted by the Greeks. Other zodiacs were used by the Egyptians and Chinese, who had one of 12 signs at least seven centuries B.C.; the Mexicans had 20 zodiacal signs; and the lunar zodiac of 27 or 28 sections has been extensively used in the East. It was believed till the beginning of the 19th century that all the planets moved within the zodiacal belt, but the discovery of the minor planets showed this to be erroneous. See Aries; Ecliptic; Equinox; Precession; Season.

Zodiacal Light. Term applied to the cone of faint light in the sky, which may be seen stretching along the zodiac from the W. horizon after evening twilight has faded, and from the E. horizon just before the beginning of morn-

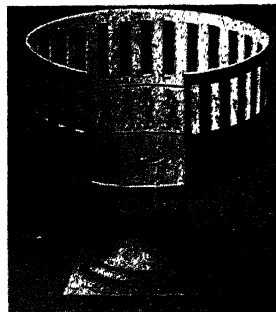
ing twilight. In middle latitudes of the N. hemisphere its appearance is most frequent from Jan. to March after sunset, and in autumn before sunrise.

This light is weaker, as a rule, than that of the Milky Way. It accounts for about 30 p.c. of light from the sky at midnight. Its spectrum is identical with that of sunlight.

Zoë (d. 1050). East Roman empress, 1042-50. Daughter of Constantine VIII, she married Romanus III, who came to the throne in 1028, and afterwards Michael IV, the Paphlagonian, whom she had persuaded to

put an end to the weakly Romanus in 1034. After Michael's death she raised to the throne in 1041 his nephew, Michael V, who rewarded her by sending her to a cloister on Prinkipo Island. After his dethronement, Zoë and her sister Theodora were declared joint empresses, and Zoë, at the age of 62, took a third husband, Constantine IX, with whom she reigned jointly until her death.

Zoetrope (Gr. *zoë*, life; *tropos*, turning). Mechanical invention, sometimes termed Wheel of Life,



Zoetrope with portion of drum removed to show arrangement of figures

conveying an impression of figures in actual motion. It consists of a rotating drum or cylinder perforated with slits. On the inside surface of the drum are represented figures in different progressive actions of running, jumping, etc. The drum being made to revolve, a visual impression of continuous motion is imparted to the various

objects when viewed through the holes. *Prm.* zoev-trope.

Zoffany, JOHN (1733-1810). An Anglo-German painter. Johann Zauffely went from Ratishbon (Regensburg) to study painting in Italy. After an unhappy marriage he came in 1758 to England, and after a hard struggle became celebrated as a portraitist,

especially of actors, among whom he painted Garrick and Foote. Admitted in 1769 to the newly established Royal Academy, he executed portraits of many of the members; The Life School at the R.A. is at Windsor Castle. A favourite artist of George III, for whom he painted pictures of the royal family, Zoffany travelled in India during 1783-90, and died at Strand-on-the-Green, Chiswick, Nov. 11, 1810. He is well represented in the National and National Portrait galleries, London.

Zog (b. 1895). Former king of Albania. Head of Zogolli, one of the four ruling families of the Mati district of Albania, Ahmed Zogu was born Oct. 8, 1895. He served in the Austrian army in the First Great War, and in 1920 became Albanian minister of the interior, and of war in 1921. Becoming premier in 1922, he was a bitter opponent of Yugoslav incursions into his country, and, governing with ability, pursued a strongly anti-irredentist and constructive policy. In June, 1924, a serious revolt caused him to resign and flee to Yugoslavia, but in Dec. he returned to Albania and, ousting the premier, Fan Noli, formed a new govt. On Feb. 1, 1925, he was elected president of the Albanian republic.



Zog, former king of Albania

On Sept. 1, 1928, he was proclaimed king of Albania, becoming the only Muslim monarch in Europe, and on April 27, 1938, married at Tirana the Hungarian countess Geraldine Appenyi. The mixed marriage resulted in a strong protest from the Vatican. Zog's conciliatory policy to Italy, which earned him much internal opposition, did not prevent the Italian

govt. from invading and annexing his country on Good Friday, April 7, 1939. Zog was forced into exile in Egypt and was officially deposed in 1946. See Albania.

Zoisite. One of the epidote group of minerals, composed of a complex basic silicate of calcium and aluminium. Zoisite is a rock-forming mineral often found in metamorphosed igneous rocks rich in lime; also in metamorphosed impure limestones and saussurite.

Zola, ÉMILE ÉDOUARD CHARLES ANTOINE (1840-1902). French novelist. Born in Paris, April 2,



Émile Zola

1840, of Italian, Greek, and French ancestry, he was educated at Aix and at the Lycée St. Louis, Paris, and Marseilles university, but failed to take a degree and sank into poverty.

In 1861 he started literary work with journalism, and next year became a clerk to Hachette. In 1864 appeared his *Contes à Ninon*, followed by the novel *Thérèse Raquin*, 1867. Zola now left business and devoted himself to the realistic novel. His main contribution to a current which profoundly influenced French 19th century fiction was the Rougon-Macquart series of twenty novels, beginning in 1870-71 with *La Fortune des Rougon*, and ending with *Le Docteur Pascal*, 1893.

Among the chief books of the cycle, which traces with scientific methods of social and psychological research the fortunes of a certain family, and exposes the differing effects of heredity and environment, are: *La Faute de l'Abbé Mouret*, a study of provincial life, 1875; *L'Assommoir*, dealing with the drink problem, 1877; *Nana*, the most notorious, 1880; *Pot-Bouille*, 1882; *Germinal*, descriptive of mining, 1885; *La Terre*, of peasant life, 1888; *La Débâcle*, of the Franco-Prussian War, 1892. In the trilogy of *Lourdes*, 1894; *Rome*, 1896; *Paris*, 1898, Zola traced the movement of a priest from Catholicism to free thought.

Inevitably Zola, with his courageous search for truth, his demand for detail and movement in his stories, put in a great deal that was violent and unpleasant; he dwelt upon brutality and debauchery, the grotesque and the horrible.

He probably enjoyed denunciation and exposure, for his characters were meant to typify the French men and women of his time. The body of his fiction has been compared in scope to Balzac's *Comédie Humaine*, and in form to Galsworthy's *Forsyte Saga*, but more than either it appears to be the product of mental energy that was almost demoniac. He must rank with the creative geniuses of fiction.

Zola's great popularity was in part affected by his violent intervention in politics as a champion of Dreyfus. In 1898 he launched an attack on what he believed to be a conspiracy by government and military, publishing the open letter beginning *J'accuse*, in *L'Aurore*. (See Dreyfus Case.) Riots broke out. Zola was both mobbed and chaired, and was sentenced to imprisonment and fine, but spent some months in exile in England, returning to France in 1899 on the revision of the Dreyfus trial. He was accidentally poisoned by gas fumes in his bedroom in Paris on the night of Sept. 28-29, 1902. There was an amazing demonstration at his funeral. In 1908 his body was placed in the Panthéon.

Bibliography. Most of the novels exist in Eng. trans., notably by E. A. Vizetelly. So does *Le Procès Zola*, an account of the trial in 1898. Consult also E. Z., *Novelist and Reformer*, Vizetelly, 1904; Z. and His Time, M. Josephson, 1928; Zola, H. Barbusse, Eng. trans., 1932. In a film, *The Life of E. Z.*, 1938, Paul Muni took the part.

Zollverein (Ger. *Zoll*, customs; *verein*, union). Term used historically for a union of German states adopting a common tariff against goods imported from outside and practising free trade among the members. The first Zollverein was formed in 1819. In 1828 Bavaria and Württemberg formed a union, and in 1833 these N. and S. unions were amalgamated. The German Zollverein gradually embraced all the states of the N. German Confederation.

Zomba. Capital of Nyasaland Protectorate. It is situated on the slopes of Mount Zomba at an alt. of 3,000 ft., 40 m. N.E. of Blantyre, and is connected by road with Liwonde, on the Shire river, and Fort Johnston.

Zone (Gr., girdle). Large region, represented ideally as surrounding the earth, over which climate is roughly uniform. Since the temperature of a place chiefly depends upon the amount of radiation received from the sun,

the first attempt at division of the earth's surface into climatic zones was determined by astronomical considerations. On this basis there are a torrid zone straddling the equator and limited by the tropics of Cancer and Capricorn (lat. 23½° N. and S.); two temperate zones extending from the tropics to the polar circles (lat. 66½°); and two polar zones beyond.

Current practice is to define the limits of the temperate zones by the temps. of the coldest and warmest months, e.g. in the N. hemisphere the Jan. 64° F. isotherm and the July 50° F. isotherm have been proposed by Köppen as the respective equatorial and polar boundaries. The former may be said to represent the S. limit of comfortable mean temps.; the latter coincides with the N. limit of regions in which trees are found. Similar boundary lines apply in the S. hemisphere. It has also been necessary to supplement the five original zones by three more, i.e. N. and S. dry belts at the boundaries of the torrid zone, and the boreal tree belt between the N. temperate and N. polar zones. These do not completely surround the earth.

Zone time is the name given to the system, now almost universal, under which national standards of time differ from one another by multiples of half an hour or one hour, i.e. corresponding with 7½° or 15° of longitude. Hence, in e.g. the U.S.A. and Canada, several zone times are in force. See Climate.

Zone. In geology, a group of strata marked by the occurrence of a distinctive fossil or group of fossils. To be of value as a zonal index the particular fossil should have had a restricted existence in geological time, a wide distribution, and easily recognizable features, have been capable of existing under different conditions, and be of common occurrence. Zones are thus subdivisions of larger geological periods, e.g. the Cretaceous System is divided into five groups, Wealden, Lower Greensand, etc., but each of these is further split into zones. The Chalk, for example, can be subdivided into some eleven zones, all represented by characteristic fossils. See Fossil; Geology.

Zooïd. Term used for an organism which does not proceed from an egg, but is produced by budding or fission from a preceding individual. The term is also used for an individual member of a compound or colonial animal. See Biology.

Zoological Gardens. Area set apart for the exhibition and study of living animals. The Jardin des Plantes, Paris, the zoological garden, Berlin, the national zoological park at Washington, and the zoological gardens at Dublin are some of the largest. Those of the Zoological Society of London in Regent's Park, founded 1828, cover 34 acres, and include mammals, birds, and reptiles from all parts of the world. There are an aquarium and an insect house. By the building of the Mappin Terraces a greater amount of freedom was given to many animals. In 1927 the trustees bought about 500 acres at Whipsnade (*q.v.*) as a zoological park, opened in 1931. *See* Regent's Park.

Zoological Society. Association of persons for the promotion of zoological research. Such societies exist in all civilized nations. At the head of them stands the Zoological Society of London, founded in 1826 and granted a royal charter three years later.

Zoology (Gr. *zōon*, living creature; *logos*, discourse). That branch of the science of biology concerned with the structure, life, habits, and classification of animals, as distinguished from botany, which deals with plants. *See* Animal; Biology; Mammal.

Zorndorf. Village in that part of Germany placed under Polish administration by the Potsdam agreement. It is 5 m. N. of Küstrin and is famous as the scene of a battle fought Aug. 25, 1758, between the Prussians and the Russians during the Seven Years War. This was stubbornly contested throughout the day by about 40,000 men on either side, and ended in a Russian retreat. Both combatants lost very heavily, and the encounter ranks as one of the bloodiest of the century. *See* Seven Years War.

Zoroaster or **ZARATHUSTRA** (Pers. Zardusht). Founder or prophet of the old Persian religion. He figures as an historical person in the oldest portion of the *Zend-Avesta*. He is believed to have been born in N.W. Persia, not later than

660 B.C., perhaps much earlier. Legend asserts that he was of noble family, received the ancient Parsee scriptures from a divine source, and was murdered in Bactria when the Turanians took Balkh. *Consult* Z., Prophet of Ancient Iran, A. V. W. Jackson, 1899. *Pron.* Zoro-aster.

Zoroastrianism. Religion of ancient Persia. Named after its founder or prophet, Zoroaster, it aimed at a reformation in the life of the people. It was adapted to the needs of a pastoral community, was monotheistic, and inculcated hospitality, philanthropy, and benevolence as against Turanian brigandage, and the polytheism, idolatry, and licentiousness of the primitive Aryans. It was persuasive, or passive, rather than propagandist, and its central idea was of a world contest between the forces of good and evil, or between light and darkness, personified as Ormuzd and Ahriman, in which struggle it was man's duty to help the good. Flourishing between the 6th and 4th centuries B.C., Zoroastrianism was made the state religion under the Sassanids, A.D. 227-651, and suffered partial extinction by Mahomedanism. Great reverence was paid to the elements. Moore's poem, *Lalla Rookh*, popularised the name fire-worshippers, by which the adherents of Zoroastrianism are sometimes designated. *See* Parsees; *Zend-Avesta*.

Bibliography. Essays on the Sacred Language, Writings, and Religion of the Parsees, M. Haug, 1862; Trans. of Herodotus, 1858-60, and Five Great Monarchies of the Ancient Eastern World, G. Rawlinson, 1862-67; Chips from a German Workshop, F. M. Max Müller, 1868-75; Zoroastrian Problems in the 9th Century Books, H. W. Bailey, 1943.

Zorrilla, José (1817-93). Spanish poet and dramatist. Born Feb. 21, 1817, at Valladolid, the



José Zorrilla,
Spanish poet

son of a lawyer, he studied at Madrid and took up the law, but eventually abandoned it for literature. He died in poverty Jan. 23, 1893. Yet his name was familiar to all speakers of the Spanish language, by whom he is regarded as one of the foremost poets. His verse is rich in phrasing and full of emotion. Zorrilla is especially famous for his dramatic work *Don Juan Tenorio*, 1844, still per-

formed throughout the Spanish-speaking world of Europe and America. The *Dagger of the Goth*, and *The Shoemaker and the King*, are well known.

Zorrilla de San Martín, JUAN (1857-1931). Uruguayan poet and diplomatist. Born in Montevideo,



Zorrilla de San
Martín,
Uruguayan poet

and educated at the Jesuit College of Santa Fé, Argentina, he devoted himself to government service, being for a time Uruguayan minister in London. The publica-

tion in 1888 of his epic *Tabaré*, based upon an Indian legend of Uruguay, and with strong resemblance in theme and manner to *Hiawatha*, established him securely as the most eminent poet of his country. *Tabaré* has been translated into French and made the theme of an opera successfully produced in Spain. It is widely read throughout Spanish America. Zorrilla died Nov. 3, 1931.

Zouave. Name given to a certain class of African infantry in the service of France, originally recruited from the Zwawa, a tribe of Berbers, in 1831.

Up to the Second Great War there were four regiments of Zouaves, each of five battalions, but they consisted exclusively of Frenchmen, and were regarded as *corps d'élite*. The uniform is a picturesque adaptation of Moorish dress, the short blue Zouave jacket and baggy red trousers being particularly distinctive. Zouaves fought under Leclerc in N. Africa, and one regt. retook Belfort, Nov. 20, 1944.



Zouave in Moorish
uniform

Zoutpansberg. Range of mts. in the N.E. of the Transvaal, S. Africa. With an alt. of 3,000 to 4,000 ft., they form a N. extension of the Drakensberg, and give their name to an extensive dist. now crossed by the rlys. from Pretoria to S. Rhodesia. The dist. is rich in minerals and game.

Zsigmondy, RICHARD (1865-1929). Austrian chemist, born in Vienna, April 1, 1865. Lecturer at



Zoroaster,
Persian prophet
From a rock sculpture

Graz university from 1893, he was in 1897 appointed scientific member of the Schott glass combine at Jena. With Siedentopf he invented the ultra-microscope, 1903. He was made professor of colloid chemistry at Göttingen, 1908, subsequently inventing the star dialyser and the ultra-membrane filter. Chiefly for devising methods of making colloidal solutions, especially in connexion with purple of Cassius, and for measuring ultra-microscopic quantities, he was awarded the Nobel prize for chemistry in 1925. He died Sept. 23, 1929.

Zuchero or **ZUCCARO**, **FEDERICO** (1543-1609). Italian painter. Born at St. Angelo in Vado, he studied under his brother Taddeo (1529-66). After cooperating with the latter in the decoration of the Vatican, Belvedere, and other buildings, he visited France and the Netherlands, and, in 1574, England, where he painted portraits of Elizabeth and Mary Queen of Scots. He established the academy of S. Luke in Rome, and died at Ancona. See Bacon, Sir N.; Elizabeth illus. p. 3028; Norris, Sir J.

Zug. Lake of Switzerland. Formed by the river Aa, and situated mostly in canton Zug and partly in Schwyz, it is 9 m. in length and 2½ m. in breadth.

Zug. Small canton of north-central Switzerland. It is situated S. of Zürich, E. of Lucerne and Aargau, and W. of Schwyz. Mountainous in the S. and S.E., its chief heights are the Kaiserstock (8,530 ft.) and the Rossberg (5,190 ft.). To the N.W. it is rich in cornfields and orchards. The canton contains the Lake of Aegeri and the bulk of that of Zug. The chief streams are the Reuss, Sihl, and Lorze. Cattle breeding, cotton spinning, agriculture, and the manufacture of condensed milk are the principal occupations. The capital, which stands at the N.E. corner of the lake 18 m. by rly. S. of Zürich, has the same name as the canton, and a pop. of 12,372. Zug joined the Swiss confederation in 1352. Area, 93 sq. m. Pop. 36,643.

Zugspitze. Highest mt. of Germany, 9,720 ft. alt. In S. Bavaria, near the Austrian border, it is 54 m. S.S.W. of Munich.

Zuider Zee or **ZUYDER ZEE** (Dutch, south sea). Former inland sea of the Netherlands, opening from the North Sea. The is. of Texel, Vlieland, Terschelling, and Ameland lay across the N. opening. Its greatest length, S.S.W. to N.N.E., was about 83 m., its greatest width about 34 m. Its average

depth was 12-13 ft. The chief islands were Wieringen, Marken, Urk, and Schokland. The North Sea Canal (Noordzee Kanal) joined it with the North Sea at Ymuiden. Ports included Amsterdam, Nieuwediep, Kampen, Harderwijk, and Harlingen, and fishing was of importance.

The Zuider Zee in early historical times was forest land, the enclosing islands being part of the mainland. During the 12-14th centuries enormous encroachments were made by the sea. Recovery of the land began in the 17th century in the prov. of N. Holland. The Zuider Zee ceased to exist with the completion of the great dyke from the N. Holland coast to Wieringen, and thence to Friesland, a total length of nearly 20 m., in 1933. See Netherlands: Land Reclamation; Yssel Meer.

Zulia. North-western state of Venezuela, bordered on the W. by Colombia. On its other sides it touches the states of Falcón, Lara, Trujillo, and Táchira; and it almost surrounds Lake Maracaibo (q.v.). The surface is mostly low-lying and well watered, the chief rivers being the Zulia and the Catatumbo; it also contains many lakes. Much is covered by forests of potentially valuable timber. The capital is Maracaibo. Area, 25,283 sq. m. Pop. 345,667.

Zuloaga, **IGNACIO** (1870-1945). Spanish painter. Son of a ceramic manufacturer, Zuloaga y Zabaleta



Ignacio Zuloaga, Spanish painter. Self-portrait, reproduced by courtesy of the Hispanic Society of America.

was born at Eibar, near Bilbao, July 26, 1870, and learnt the art of damascening metal for armour and arms in his father's factory. He studied painting in Rome and Paris, and after a visit to England returned to Spain, and was during 1892-99 an art critic. Settling near Segovia, he painted studies of bull-fighters, dwarfs, dancers, brigands, and portraits of society women; his art was essentially Spanish, with occasional satire derived from Goya. Little Doña Mercedes is in the Luxembourg; Family of My Uncle Daniel is at Boston, Mass. Zuloaga died in Madrid, Oct. 31, 1945.

Zulu or **AMAZULU**. Negroid people of Bantu speech, mostly N. of the Tugela river in S. Africa. Essentially one in race, language, and culture with the Xosa Kaffirs,

they became distinguished from them by the autocratic military organization introduced, after a visit to Cape Town, by Dingiswayo, and developed by his successor Chaka (1783-1828), seventh in descent from a legendary chief Zulu. They include the Swazi and Tonga tribes, as well as those bands whose reflex migrations beyond the Limpopo, begun in Chaka's day, resulted in the formation of the Matabele and Angoni confederations, and exerted political influence up to the Victoria Nyanza about 1859. They are famous for physique and fighting qualities. See Africa, and colour plate; Cetywayo; Kaffir.

Zululand. Maritime country in S. Africa. Lying in the N. of Natal, it was annexed by that prov. in 1897 and is now a division. It extends from the Tugela River on the S. to Swaziland and the Portuguese territory of Mozambique on the N. It has an area of 10,427 sq. m. and a seaboard of 210 m. The country is flat in the coastal regions but gradually rises to 5,000 ft. in the interior. It is well watered, the chief rivers being the Pongola, Umkusi, Umgavuma, Umfolozi, and Maputa; in connexion with the last is a large irrigation scheme.

The climate is comparatively healthy, though malaria is prevalent. Heat would be oppressive were it not for frequent violent thunderstorms. The tsetse fly, which once infested Zululand, was overcome by an ingenious trap made in the form of an animal, at which the flies seek their food by sight. Gold occurs, though production is low; also silver, copper, lead, tin, asbestos, and coal. Pop. approx. 260,000.

Under their chief Chaka, the Zulus early in the 19th century were welded into an invincible army and their country became a powerful kingdom. Chaka was slain by his half-brother Dingaan, who has achieved fame in African history because of the total defeat of his army of 12,000 by a few hundred Boers on Dec. 16, 1838. Dingaan was deposed next year. In 1873 Cetywayo became king, but in 1879 came into conflict with British forces under Chelmsford. Several engagements took place, notably at Isandhlwana, Jan. 22, Rorke's Drift on the same day, Ginginhlovu on April 2, and Ulundi on July 4. At the last battle the power of the Zulus was completely broken. Zululand was declared British territory in 1887 and annexed to Natal ten years

later. In 1906 a serious native rebellion in Natal spread to Zululand, but was suppressed by the colonial forces. *See* Isandhlwana; Natal; South Africa; Ulundi.

Bibliography. Cetewayo and his White Neighbours, Sir H. R. Haggard, 1896; *Story of the Zulus*, J. Y. Gibson, 1911; *History of the Zulu Rebellion*, 1906, J. Stuart, 1913; *Zulu Battle Piece*, Sir R. Coupland, 1948.

Zungaria. Tract of mountainous country in the N. of Sinkiang, China. Adjoining Kazakh S.S.R. on the W. and Mongolia on the E., it marks the extent of the empire of the Zungars in the 18th century. *See* Sinkiang.

Zunz, LEOPOLD (1794-1886). German Jewish scholar, born at Detmold, Aug. 10, 1794. From the age of 21 he devoted himself to the study of ancient Hebrew manuscripts. In 1819 he founded a league for the study of Jewish culture, of which many leading German Jews became members. Sometimes called the founder of the science of Judaism, he was a popular preacher and writer, his historical books being of unequalled value as statements of fact and as sources concerning the Jewish people. In 1840 he became first director of the Lehrerseminar in Berlin. He died March 8, 1886.

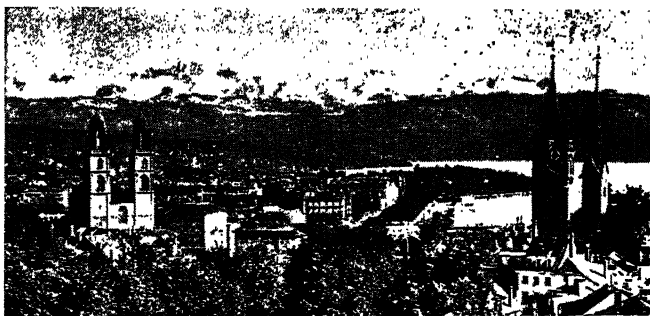
Zurbaran, FRANCISCO DE (1598-c. 1664). Spanish painter. Born Nov. 7, 1598, at Fuente



F. de Zurbaran,
Spanish painter

de Cantos, he studied under Juan de las Roelas at Seville. His art, naturalistic and a little sombre, is distinguished by a note of sincere piety. His best works include the decoration of the high altar in the Jesuit collegiate church of S. Thomas Aquinas, Seville; a series of paintings for the Carthusians of Santa Maria de la Cuevas, now in the Seville gallery; and an Adoration of the Shepherds, now in the National Gallery, London. He was town painter of Seville, 1629, and court painter, 1638. In 1650 he visited Madrid, where he was employed on the decoration of the Buen Retiro, and where he died. Known as the Spanish Caravaggio, he was a friend of Velazquez.

Zürich. Lake of Switzerland. The major portion is in the canton of Zürich. Length is 25 m., greatest breadth $2\frac{1}{2}$ m., area 34 sq. m., and maximum depth 470 ft. The Linth enters the S.E. end and



Zürich, Switzerland. General view showing the Grossmünster (left) and the lake and Alps beyond

the Limmat carries the drainage of the lake to the Aar.

Zürich. Canton of Switzerland. It abuts on the Rhine and on Germany in the N., where it comprises undulating lowland; in the S. numerous mountain ridges separate narrow steep-sided valleys, in one of which is the lake of Zürich; the Limmat, Töss, Thur, and other rivers flow in general N.W. The soil is carefully tilled, and there are extensive vineyards. Textile industries and the manufacture of machinery, paper, leather, and embroideries give employment to the people, who are mainly German-speaking Protestants. The canton joined the confederation in 1351. Its area is 668 sq. m. Pop. 772,617.

Zürich. The largest city and former capital of Switzerland. The capital of the canton of Zürich, it stands at the N. end of the lake of Zürich, 41 m. by rly. and 25 m. direct N.N.E. of Lucerne. The Limmat separates the Grosse from the Kleine Stadt; it is crossed by the fine Münster bridge. Near by is the Grossmünster, a Romanesque church with Gothic features, built 1090-1150, 1225-1300, of which Zwingli, who began his reformation here in 1518, was pastor. Other fine churches are the Frau Münster, erected in the 13th and 14th centuries, the modern church of Our Lady, and S. Peter's with the tomb of Lavater, once the pastor. Their bells leave an unforgettable impression.

The Swiss national museum, a large building opened in 1898, occupies the tongue of land between the Limmat and its affluent, the Sihl. The university, refounded in 1833 from a 16th century original, has faculties of theology, law, medicine, veterinary medicine, and philosophy. Near it is the federal institute of polytechnics, built 1860-64, belonging to which are archaeological, geological, and other collections. The

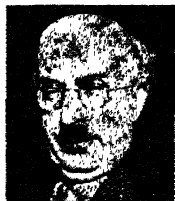
German Renaissance town hall dates from 1694. The foremost commercial and industrial city in the republic, Zürich is chiefly interested in silk manufactures; cottons, paper, chemicals, and machinery are also produced. This is the centre of Swiss banking and commerce, and a headquarters of international trade. Pop. 336,395.

Zutphen. Town of the Netherlands, in the prov. of Gelderland. It lies on the Yssel, 19 m. by rly. N.E. of Arnhem, and is an important rly. centre. There is trade in timber and dairy and agricultural produce, and paper, tobacco, soap, and textile industries. The Gothic church of S. Walpurgis is a 12th century foundation with 17th century tower, and a fine library with chained books. The town hall, the 17th century Wynhuis tower, and remains of the town walls are notable. The battle of Zutphen, between the English and the Spaniards, was fought at Warnsveld near the town, Sept. 22, 1586, when Sir Philip Sidney, in command of the English forces, was mortally wounded. In German hands from May, 1940, Zutphen was captured April 7, 1945, by Canadian infantry after fierce fighting. Pop. 21,505.

Zweibrücken (Fr. Deux Ponts, two bridges). Town of Rhineland-Palatinate, W. Germany, 30 m. E. of Saarbrücken. The cap. and residence of the duchy of Palatinate-Zweibrücken 1410-1815 (though for the last 20 of those years in French possession), it had a fine Baroque palace (1720-30), a huge Gothic church with five naves (1493-1510, reconstructed 1904-11), town hall (1779-85), a theatre, museum, libraries, public schools, park, and racecourse. From 1815 the town belonged to Bavaria. There were engineering, textile, footwear, and cigar works, and the ducal printing plant was famous in the 18th century for its *Editiones Bipontinae*. Captured by the U.S. 7th army March 20,

1945, the town came in the French zone after Germany's surrender. Pop. 20,770. *See* Saar Basin.

Zweig, ARNOLD (b. 1887). German writer. Son of a saddler, he was born at Gross-Glogau, Prussia, Nov. 10, 1887, and studied philosophy at a number of German universities. Service in the First Great War deeply coloured his outlook as a writer and



Arnold Zweig,
German writer

provided the themes of many novels. After living in Bavaria until 1923, he settled in Berlin, but in 1933 was expelled from Germany by the Nazis, making his home at Haifa, Palestine. A writer of great power, he gained international reputation with *The Case of Sergeant Grischa*, 1927. Other novels included *Education Before Verdun*, 1935; *Crowning of a King*, 1937. He published a play, *The Axe of Wandsbek*, 1947.

Zweig, STEFAN (1881-1942). Austrian-born British writer. Born of Jewish stock in Vienna, Nov. 28,



Stefan Zweig,
Austrian-born
British writer

1881, he was educated there. After publishing verse and becoming well-known as a translator of Baudelaire, Verlaine, and Verhaeren, he gained the friendship of Freud, and wrote biographical studies in which sexual psychology was emphasised: *Fouché*, 1929; *Marie Antoinette*, 1931; *The Queen of Scots*, 1935. His German version of *Volpone* was a notable success, and he achieved international reputation with pathological studies of Tolstoy, Nietzsche, Hölderlin, and Kleist. Zweig's works were banned by the Nazis, and he escaped from Austria after they invaded that country, coming to England and becoming a British subject. He committed suicide with his wife at Petropolis, Brazil, about Feb. 23, 1942. A biography of Balzac on which he had worked for 20 years was unpublished. *Consult* *Life*, by his wife, new ed., 1947.

Zwickau. Town and district cap. of Saxony, E. Germany. One of the oldest and most important

towns of E. Germany, it was until the Second Great War an industrial centre, based upon a large coalfield. Its district, with 870 persons to the sq. m., was one of the most densely populated in the country. Situated on the Mulde, 40 m. S. of Leipzig, at an alt. of 880 ft., it was a rly. junction and had an airport. Though concerned with coal, gas, electricity, engineering, chemicals, and ceramics, the city was romantic in its centre, where stood the Gothic S. Mary's church (1118, reconstructed 1505-37) with a tower 237 ft. high and remarkable paintings by Lucas Cranach; also S. Catherine's (1212-19), where Münzer preached in 1520-21; the cloth hall (1522-36), later a theatre; and Osterstein castle (1565-85). Schumann was born here. Originally a Sorbian settlement and known since 1118, it was a town from 1212 and came to the Wettin dynasty in 1307. Zwickau as a centre of the Anabaptist movement was saved from disaster by Luther's personal intervention. It became rich by the mining of silver in the neighbourhood, and won fame for its public school and civic library in the 16th century. Captured by the U.S. 3rd army, April 18, 1945, it came within the Russian zone after the surrender of Germany. Pop. 128,000.

Zwingli, ULRICH (1484-1531). Swiss religious reformer. Born to a peasant couple at Wildhaus, St. Gall, Jan. 1, 1484, and educated at Berne, Vienna, and Basel, he became a teacher of the classics, a parish priest in 1506, and for a time acted as an army chaplain, during which period he seems to have acquired doubts about doctrine. Basing his teaching on the Gospel and the Fathers, Zwingli publicly denounced the authority of the pope in matters of politics, and later of faith, and opposed the sale of indulgences. In 1518 he became pastor at Zürich, and under a Protestant government was able to teach reformed doctrines freely.

His sermons caused a cleavage in Zürich, but in 1523 the council adopted his views. He broke with Luther over the doctrine of the Eucharist, teaching that it is nothing more than a symbolic meal. From 1527 he engaged with the

troops in the war between Zürich and the R.C. cantons, and was killed in battle at Cappel, Oct. 11, 1531. Unlike Luther, Zwingli called for a complete breach with medieval practice and hoped to see church government identical with civil. As a believer in predestination he anticipated Calvin. His doctrine was set out in the Helvetic Confession of 1536. A biography by S. Simpson appeared in 1902. *See* Reformation.

Zwolle. Town of the Netherlands, in the prov. of Overijssel. It lies on the Zwartewater, 19 m. by rly. N. of Deventer, and is an important rly. junction. There is busy trade in local dairy and agricultural produce. Industries include brewing, distilling, tanning, soap, tobacco, and butter making. The large church of S. Michael was begun in 1406, and the R.C. church of Our Lady is a 15th century building with a tower 300 ft. high. The town hall was originally built in 1447. In German occupation from May, 1940, Zwolle was liberated by Canadian infantry, April 14, 1945. Part of the "temporary" Waterloo bridge from London was incorporated in a temporary bridge over the Zwartewater to take the place of one destroyed by the Germans. Pop. 46,845.

Zygote. Biological term applied generally to the product of fusion of two gametes. From it the new sexually produced individual develops. In botany the kind of zygote formed by the fusion of two structurally similar gametes is termed a zygospore, to distinguish it from the kind called an oospore which results from the fertilisation of an egg cell by a structurally different and usually smaller male gamete.

Zymotic Disease. Term embracing those communicable or infectious diseases which occur in epidemic form.

Zyrians. Name given to a Finnish tribe inhabiting part of the territory between Perm and Archangel, N. Russia, and occurring in smaller numbers along the lower Ob, Siberia. They are akin to the Permian tribes. *See* Komi-Zyrian.

Zywiec. Town of Poland, 40 m. S.W. of Cracow, near the Czechoslovak border. At an alt. of 1,150 ft. on the Beskid slopes, it has wood, chemical, and liquor industries, and a famous Hapsburg castle with park. Pop. 6,398. Zywiec gives its name to a district. In German-occupied Poland from Sept., 1939, it was liberated by the Russians during Jan., 1945.



Ulrich Zwingli,
Swiss reformer
After Holbein the
younger

THE NEW UNIVERSAL ENCYCLOPEDIA is a work of such great length that it must necessarily be printed in sections over a fairly long period of time; and events in the twentieth century move so rapidly that changes have inevitably occurred during the time between the sending to press of the first and the last sections of the work. In this final section of "newest words" is given the latest

information available on all subjects treated in the main text at the time of printing these last pages. Reference forward to this section will be found in a number of articles in the main text; but many items find a place here to which there is no reference from the main text. Biographies of personalities who came into the public eye only after the Second Great War are among the new subjects.

Death of H.M. King George VI and Accession of H.M. Queen Elizabeth II

TO British people everywhere the most outstanding event to occur since this edition went to press has been the change in the occupancy of the British throne. **George VI** died suddenly of coronary thrombosis, at Sandringham House, in the early hours of Feb. 6, 1952. His body was brought to London, where it lay in state in Westminster Hall for three days before burial in St. George's Chapel, Windsor, Feb. 15. He was succeeded by his elder daughter, the Princess Elizabeth Alexandra Mary, duchess of Edinburgh, who became queen-regnant by the name and style of **Elizabeth II**. The words of the proclamation, as read in the U.K., described her as "Queen of this Realm, and of her other Realms and Territories, Head of the Commonwealth." At the time of her accession she and her husband the duke of Edinburgh were in Kenya, on the first stage of an official tour which was to have included Australia, New Zealand, and Ceylon. The tour was at once postponed, and the queen flew back to London. Prince **Charles PHILIP ARTHUR GEORGE** (*q.v.*) became the heir-apparent to the throne, also duke of Cornwall, duke of Rothesay, earl of Carrick, baron of Renfrew, lord of the isles, and prince and grand steward of Scotland. Princess **Anne** (*q.v.* in this N.V. section) became second in the line of succession, and Princess **Margaret** (*q.v.*) third.

Those who use this Encyclopedia will doubtless be prepared to make for themselves the mental adjustments consequent upon these facts, wherever necessary in various contexts throughout the work—not only in the articles on the various personages mentioned, but under such headings as ROYAL FAMILY, UNITED KINGDOM, etc. They will also appreciate that the succession of a king by a queen has affected such nomenclature, well established over a period of 50 years, as KING'S BENCH DIVISION, KING'S COUNSEL, KING'S EVIDENCE, KING'S MESSENGERS, KING'S PROCTOR, KING'S REGULATIONS, and KING'S SPEECH, all of which have separate headings in this Encyclopedia under these titles, as well as innumerable other, more general, references which now call for a change in gender, if only in the use of the personal pronoun.

Abdullah Ibn Hussein. King of Jordan. In April, 1951, in spite of protests by the Arab League he proclaimed the union of Arab Palestine with Transjordan, to form the kingdom of Jordan. His Memoirs were published in English in 1950. He was shot dead in Jerusalem, July 20, 1951, by a 21-year-old assassin, and was succeeded by his son, Talal.

Aberdare. Under the 1948 redistribution of parl. seats Aberdare gives its name to a bor. constituency.

Aberdeenshire. Under the 1948 redistribution of parl. seats Aberdeenshire had 2 co. and 2 burgh constituencies, Kincardineshire being joined to Angus.

Acheson, **DEAN GOODERHAM** (b. 1893). American politician. Born April 11, 1893, at Middletown, Conn., he was educated at Yale and the Harvard law school. His appointment in 1919 as private secretary to an associate justice of the supreme court was followed in 1921 by a partnership in one of the leading legal firms in Washington. Acting secretary of the treasury for a short time in 1933, he was appointed assistant secretary of state, 1941, U.S. member on the council of U.N.R.R.A., 1943, and under-secretary of state, 1945-47. In this last capacity he was a firm upholder of the "Truman doctrine" by

which the U.S. offered protection to Greece and Turkey, and it was he who first made tentative proposals in a speech at Cleveland, Miss., for economic aid to Europe on lines developed in the European Recovery Programme (*q.v.* in N.V.).

Truman appointed him in succession to George C. Marshall as sec. of state, Jan. 21, 1949. Before the senate committee examining his fitness for that post he admitted his friendship with Alger Hiss (*see* Hiss Case, in N.V.), although maintaining unqualified opposition to Communism. In his first year of office he completed the negotiation of the North Atlantic Treaty (*q.v.* in N.V.) and obtained congressional assent to the most ambitious peacetime arms programme ever presented in the U.S.A. He backed U.N. action in Korea (*q.v.* in N.V.).

Achilles. In 1948 this British light cruiser was transferred to the Indian Navy and renamed Delhi.

Adenauer, **KONRAD** (b. 1876). First chancellor of the Western German republic. Born at Cologne, of a R.C. family, Jan. 5, 1876, he studied law and became a deputy judge in 1901. He then entered the municipal government in his native city, being elected lord mayor in 1917. A member of the centre party, after the 1918 revolution president of the Prussian state council, he refused the German

chancellorship and concentrated on his work in Cologne, which he helped to make enterprising and prosperous. Dismissed immediately the Nazis came to power in 1933, and subsequently twice imprisoned, Adenauer made no compromise and he was reappointed



lord mayor when the city was occupied by the Allies, 1945. Having the decisive share in creating the Christian Democratic Union, a mixed Protestant and R.C. bourgeois party, he was made speaker of the Bonn assembly in 1949, and when elections to the first federal parliament gave his party 139 out of 402 deputies, became chancellor of a coalition cabinet of C.D.U., Liberals, and a German party, in that position negotiating with the Western Allies agreements that gave W. Germany increasing independence of action.

Adoption. The Adoption of Children Act, 1949, placed the adopted child in almost the same position as every other child. Adopted children are treated (in England but not in Scotland) as though they were actually the

children of their adopting parents for the purpose of intestate or testate succession. In Scotland as well as in England an adopted child and the adopter are within the prohibited degrees of consanguinity. For all adoptions a probationary period of three months is necessary before an order can be made. The Adoption Act, 1950, consolidated the law on adoption.

Africa. After the Second Great War, development of African resources was intensified, particularly in Belgian and British territory. Belgium further developed the minerals, especially uranium, of the Congo; the U.K. developed agriculture in E. Africa and industry in the Rhodesias. The Ground Nut Scheme (*q.v.*) in Tanganyika and Kenya, put into operation in 1947, was an important social as well as industrial experiment.

All the British W. African colonies received new and more democratic constitutions during 1945-50.

Of the former Italian colonies, the U.N. decided that Libya (Cyrenaica and Tripolitania) should be united into one independent country by 1952, remaining meanwhile under British administration. Somaliland was placed under Italian trusteeship for ten years from 1950, thereafter to be independent. Eritrea continued under British administration pending a U.N. decision as to its future.

Egypt and the British govt. on behalf of Uganda entered into an agreement in 1949 for the development of irrigation and hydro-electric works (est. to take 25 years to complete) at the Owen Falls near Lake Victoria, headwaters of the White Nile. Work began at Jinja in 1950. (*See* Owen Falls Dam, in main text.)

The international-scientific committee for trypanosomiasis research, set up as a result of an international conference at Brazzaville in Feb., 1948, met for the first time in London, Feb. 8-11, 1949. The meeting was attended by representatives of the U.K., France, Belgium, Portugal, S. Africa, and S. Rhodesia. *See also* South Africa, in N.V.

Agent-General. The title of the Eire representative in London was changed from high commissioner to ambassador, July 26, 1950.

Agricultural Labourer. Minimum wage rates were increased on Nov. 12, 1950, to £5 for male, and £3 16s. for female, full-time workers for a 47-hour week.

Agriculture, ASSOCIATION OF. British society founded 1947 to protect the interests of agriculture and provide closer understanding between town and country. It developed from the body known as the Central and Associated Chambers of Agriculture, a central chamber for England and Wales having been started in 1866. The avowed object of the chambers was to

watch over all measures before parliament affecting the agricultural community, and to take such action, both in and out of parliament, as seemed desirable for their benefit. In 1918 the council of the chambers adopted the constitution of a national agricultural council, with representatives of the Agricultural Co-operative Society, National Farmers' Union, etc. Scotland had a similar independent organization. The headquarters of the Association of Agriculture are at 232-241, Abbey House, Victoria Street, London, S.W.1.

Air Records. In 1947-48 U.S. pilots set up a series of new absolute speed records, the last in this period being 670.98 m.p.h. by Major R. Johnson at Muroc, Sept., 1948, flying the North American F-86. British airmen set several new marks over the 100 km. "closed circuit," J. Derry achieving an average of 605.23 m.p.h., April 12, 1949, with the swept-wing D.H. 108; over the 1,000 km. closed circuit J. Cooksey, in a Meteor, made a record May 12, 1950, with an average speed of 511 m.p.h. The height record for aeroplanes was broken, March 23, 1948, by a British pilot, J. Cunningham, with a D. H. Vampire; he reached 59,446 ft.

Ajax, H.M.S. This British cruiser was broken up in 1949.

Ajmer. State of the Union of India, formerly the prov. of Ajmer-Merwara. Pop. (1950 est.) 730,000.

Alanbrooke, 1st Viscount. He was installed as constable of the Tower, in succession to Lord Wavell, Oct. 25, 1950.

Alaska. A bill granting statehood to Alaska passed the U.S. house of representatives in 1950.

Albania. The first republican government was formed, 1946, by Ahmed Hodja (Hoxha), simultaneously foreign minister. The mining of the Corfu channel off the Albanian coast led to the blowing up, Oct. 22, 1946, of the British destroyers Volage and Saumarez, thirty-eight being killed and forty-five wounded. The U.K. brought the matter before the security council of the U.N. April, 1947. In spite of support for Albania by the U.S.S.R., the international court of justice was invoked. (*See* Corfu Channel, in N.V.)

Albania concluded a 30-year treaty and customs union with Yugoslavia, Jan., 1947, but turned against Yugoslavia in that country's conflict with the Cominform; refused the offer of Marshall aid in July, 1947; and was involved in many border incidents with Greece, through assisting, and serving as a base of operations for, the Greek rebel army.

Alcan Highway. The official name for this strategic road connecting the U.S.A. and Alaska across Canada is Alaska Highway.

Alemán, MIGUEL (b. 1902). Mexican president. Born in Sayula, Vera Cruz state, the son of a revolutionary general, he practised as a lawyer, and became a justice of the federal appeals court and a member of the senate. He was governor of Vera Cruz state 1936-40. Minister of the interior and of government under President Avila Camacho from 1940. Alemán was elected president of Mexico, 1946.

Alexander, ALBERT V. British politician. He was created Viscount Alexander of Hillsborough in Jan., 1950. In March he ceased to be minister of defence, becoming chancellor of the duchy of Lancaster until Nov. 1951.

Algiers. Capital of Algeria. Following this city's role as France's war-time seat of government, 1943-44, and its economic development, its pop., unlike those of most other great French towns, increased rapidly. In 1947 the est. figures were 360,700 for Algiers proper, and 519,200 with suburbs, the city becoming third city of France, after Paris and Marseilles, in place of Lyons.

Allen, HERVEY. This U.S. writer died Dec. 28, 1949.

Allgood, SARA. This Irish actress died Sept. 13, 1950.

Allighan Case. Proceedings by a parliamentary committee of privileges, April-July, 1947, following public allegations by G. Allighan, M.P. for Gravesend, that M.P.s often disclosed confidential information to newspapers for cash payments. Allighan, a professional journalist, made the statements in an article in *World's Press News*.

The report of the committee of privileges, published July 30, after examination of witnesses, stated that the general charges were unfounded and constituted grave contempt and a gross breach of privilege. The only such transactions that could be established as having occurred were accounts of one private meeting of the parliamentary Labour party. Such an account in the *Evening Standard* was revealed to have been written by Allighan himself, who admitted to control of a press agency through which he had received £120 a month for such information. He was expelled from the house.

Altrincham. In 1948 Altrincham and Sale became a borough constituency.

American Loan. Loan from the U.S.A. negotiated by Lord Keynes in 1945. With the end of fighting, President Truman announced the immediate cessation of Lease-Lend (*q.v.* in main text). This left the U.K. with her entire industry converted to war production and no interval in which to re-equip it for peace. Keynes was therefore sent to Washington, and on Dec. 8, signed an agreement for a total loan of \$4,400,000,000 (approx. £1,100,000,000) to the U.K.

consisting of a final sum in settlement of lease-lend of \$650,000,000, and a credit for \$3,750,000,000 to be spent, between the date of ratification and the end of 1951, mainly on American goods needed for reconvertng British industry to peace use, the whole to be repaid over a 50-year period starting Dec. 31, 1951, with interest at 2 p.c. except during years when Great Britain's income from home-produced exports and invisible current transactions was less than the average amount of U.K. imports during 1936-38.

The loan agreement, which involved British support for the American programme for an international lowering of barriers to world trade, including the modification after one year of control by the U.K. of the use of sterling in the group of countries whose currency was related to the British pound, was ratified by the U.K. parliament by the end of the year. But congress did not ratify it until July 13, 1946, by which time prices had risen so steeply in the U.S.A. that a considerable part of the value of the loan had been whittled away before it became available. A year later, when the time came for the free convertibility of sterling into dollars to be put into force, more than two-thirds of the loan had already been expended. The drain on British dollar resources of allowing all those countries which had sterling credits to buy in respect of them in terms of dollars would have meant bankruptcy in a very short time, and convertibility was suspended three weeks after it started; at the same time drawings on the loan were suspended by the U.S.A. Stringent economies in buying in dollar countries followed, including the cessation of American tobacco imports. After further conversations inconvertibility of sterling was accepted by the U.S. govt. as imperative in the actual state of British economy, and on Dec. 5 the remainder of the loan was made available, the last instalment being drawn in Feb., 1948.

Ames, LESLIE. English cricketer. In 1950 he became the first professional appointed to the M.C.C. board of selectors.

Amethyst, H.M.S. British warship. A frigate of 1,490 tons, her armament including 6 4-in. and 8 2-pdr. guns, she was launched in 1943, had a speed of 20 knots and a complement of 192. On April 20, 1949, while proceeding up the Yang-tse-kiang to Nanking with supplies for the British embassy and to protect British nationals, the Amethyst came under heavy fire from Chinese Communist batteries, was severely damaged and ran aground on Rose Island, about 75 miles below Shanghai. Other British warships made abortive attempts to reach the vessel, but on April 21 an R.A.F. Sunderland brought medical aid. After unsuccessfully negotiating for three

months with the Communist authorities for a safe-conduct, the Amethyst's commander, Lt.-Cdr. J. S. Kerans, steamed down the river on July 30 and rejoined the British fleet, after coming under heavy fire at least twice.

On their return to the U.K., Nov., 1949, the ship's company received civic welcomes at Plymouth and London, and, in addition to other recognitions of individual feats of gallantry, were awarded the naval General Service medal, with an appropriate clasp. *Consult* Yangtse Incident, L. Earl, 1950.

Ancaster, EARL OF. In 1950 he resigned the office of lord great chamberlain, being succeeded by his son, Lord Willoughby de Eresby.

Anne (b. 1950), British princess. Daughter of Princess Elizabeth and the duke of Edinburgh, Anne Elizabeth Alice Louise was third in succession to the crown at birth, Aug. 15, 1950.

Ansaldi, GIOVANNI. Italian journalist. He was appointed editor of the Neapolitan daily paper *Il Mattino* on its reappearance in 1950.

Antarctic Exploration. In Feb., 1947, it was announced that the U.S. navy expedition to the Antarctic had made aerial surveys resulting in extensive alterations to the map of the Antarctic region. A large bay was discovered S.W. of the Thurston peninsula, to the W. of which was a range of mts. The bay forms an inland sea, 20,000 sq. m. in area, thus reducing the estimated area of the mainland. Some 2,000 nautical miles of newly discovered coast were charted for the first time, and 75,000 square miles, previously uncharted, were identified as ocean.

An Antarctic research expedition sponsored by the Australian govt. sailed in 1947 to carry out researches into cosmic rays and weather conditions from a base on Heard I., 2,500 m. S.W. of Fremantle. It was reported, Mar., 1950, that Big Ben, 11,000 ft. peak on Heard I., is an active volcano.

Survey work was carried out, 1948-50, in Grahamland by parties whose members were mainly British from bases on Stonington I., Marguerite Bay, and at Hope Bay. Investigations into mineral resources were also undertaken and meteorological information collected. In 1950, aircraft of the Norwegian-British-Swedish expedition to Queen Maud Land were stated to have surveyed hundreds of square miles and discovered a hitherto unknown mountain range. One of the main objects of this expedition was the observation of climatic fluctuations.

In 1949 the previously uncharted strait between Ellise and Cornwallis Islands, in the South Shetlands, was named Prince Charles Strait, after the son of Princess Elizabeth and the duke of Edinburgh.

"Antrycide." Proprietary name of a drug produced by a team

of British scientists of I.C.I. Its existence was announced by the colonial office in Dec., 1948. It was hoped the drug, a white crystalline powder, soluble in water, would prove to be a cure for, and a prophylactic against, forms of trypanosomiasis (nagana) occurring in animals, and transmitted from one host to another by the tsetse fly, and thus open areas of Africa infested with the fly to cattle raising. Administered by hypodermic injection, it showed great promise in its early tests, but further experiments under field conditions revealed marked variations in its efficacy.

Apsley House. In 1947 this house, presented by the nation to the 1st duke of Wellington, was given to the nation by the 7th duke for preservation as a Wellington museum. A condition was that it should continue to be also a residence of dukes of Wellington.

Aquitania. Withdrawn from active service, 1949, she returned to the Clyde as scrap, 1950.

Arab League. Israel signed an armistice with Egypt on Feb. 24, 1949, with Lebanon on March 23, with Transjordan (Jordan from June 2) on April 3, with Syria on July 20.

An Arab "government" claiming sovereignty over the whole of Palestine was formed at Gaza, Sept. 22, 1948, Hussein, the mufti of Jerusalem, being a week later elected president of a "national assembly" there; this govt. was recognized by all the league members except Transjordan. Abdullah on Dec. 20 approved a proposal for the union of Transjordan and Palestine made by a congress of Palestine Arabs held at Jericho; and on the same day nominated a new mufti of Jerusalem. Following general elections, April 11, 1950, in Jordan and the part of Palestine under Jordanian control, this proposal was endorsed by a joint meeting of the two houses of parliament, and Abdullah proclaimed the union on April 24.

Owing to the disapproval by the other Arab countries of this annexation of Arab Palestine, Jordan did not send a representative to the league meeting held in Alexandria in June, 1950, at which a collective security pact, modelled on the N. Atlantic treaty, was signed by five of the member countries, Iraq abstaining on the ground that the pact would be useless if Jordan did not adhere to it.

Arab Legion. During the disturbances in Palestine before the ending of the British mandate in 1948, the Arab Legion was extensively employed on police duties in Arab areas of the country. When hostilities broke out between the Arab states and the new state of Israel, on the night of May 14-15, 1948, the Arab Legion bore the brunt of the fighting for the Arab cause. During its actions in Pales-

time, the Arab Legion's British officers were withdrawn from front-line units. *Consult Story of the Arab Legion*, J. B. Glubb, 1948.

Ardennes, FIGHTING IN THE. At Bastogne, in 1950, a memorial was dedicated to 76,890 Americans killed, wounded, and missing in the Ardennes fighting of 1944-45.

Argentina. On Feb. 24, 1946, Juan Domingo Perón, leader of the National Labour party and the Peronist Radicals, was elected president of the republic in the first elections held since 1938, and inaugurated June 4. The "state of siege" which had existed with one brief interval since Dec., 1941, was declared lifted, May 24, and political parties resumed full activity. A new constitution was introduced (see p. 596). The central bank, the rlys., the internal air lines, and some shipping were nationalised; a five-year plan began in 1947; in the same year women were given the vote, and a special tax on all employers (excluding employers of domestic servants) was introduced for the benefit of state-aided industries. A general election held in Dec., 1948, was boycotted by opposition parties. An act of Sept., 1949, recognized the legality of all existing parties, but forbade party coalitions at elections.

University fees were abolished June, 1949. A pipe-line for natural gas, 1,100 m. long, from the Patagonian oilfields to Buenos Aires, was completed during 1947-49.

Over the British crown colony of the Falkland Is. and their dependencies, Argentina in 1946 renewed claims of sovereignty made in 1936. She established bases in the S. Shetlands, and an Argentine naval squadron held manoeuvres in British Antarctic waters in Feb., 1948. In this matter Argentina acted in conjunction with Chile, who also put forward claims. Both countries rejected a British proposal to submit the dispute to the international court of justice. An agreement between Argentina, Chile, and the U.K., reached Jan. 18, 1949, not to send warships S. of lat. 60° during the antarctic summer, except for customary routine movements, was renewed for 1950 and 1951.

Ark Royal. A second British aircraft carrier of this name was launched by the queen at Birkenhead, May 3, 1950.

Arsenal. This football club won the F.A. cup in 1950, for the third time.

Ashmolean Museum. The first museum in Gt. Britain to be devoted entirely to Eastern art was opened in 1949 at Oxford, as a branch of the Ashmolean.

Assam. State (formerly prov.) of India. A severe earthquake followed by flood, in the Brahmaputra valley (Sibsagar and Lakhimpur dists.) in Assam killed more than 570 and did immense damage, Aug. 15, 1950. Pop. (1950 est.) 8,510,000.

Assumption. On Nov. 1 (All Saints' Day), 1950, the Pope proclaimed the new dogma of the bodily Assumption of the Virgin Mary into heaven.

Astatine. Radio-active element, symbol At, atomic no. 85, formerly called alabamine in the U.S.A. One isotope (mass no. 218) occurs in the radium series, another (mass no. 216) in the thorium series; both emit α -rays and have a half-life of seconds only. An artificial isotope (mass no. 211) decomposes partly by emitting α -particles, and partly by k -electron capture.

Athletics. British records in July, 1950, included: 220 yds. E. McD. Bailey 21.1 secs. 440 yds. A. S. Wint 47.2 secs. 120 yds. hurdles W. F. Porter (U.S.A.), 13.9 secs. 440 yds. hurdles R. B. Cochran (U.S.A.), 52.7 secs.

Atlantic Flights. *North Atlantic.* By 1950 the major European, U.S., and Canadian transport companies were operating regular daily landplane services via London Airport, Prestwick, and Shannon (Rineanna), or the Continental capitals, to Gander and thence on to New York, Montreal, etc. Some eastbound services were non-stop New York to London. A more northerly route passed through Keflavik, in Iceland, and sometimes Bluie West, in Greenland, while other lines called at the Azores and Bermuda. A series of Weather Ships (q.v. in main text) was established by governments at the request of the International Civil Aviation Organization.

South Atlantic. B.O.A.C. and other national companies had regular services crossing the ocean between Dakar and Natal or Recife (Brazil). Other lines covered the routes Canary Is.—Cape Verde—Caracas (Venezuela), Cape Verde—Natal, and Dakar—Paramaribo (Surinam).

Atomic Bomb. Rumours of a "super bomb, 1,000 times as effective as the first atomic weapons," were started in the U.S.A., Nov., 1949, by a remark by Senator Edwin Johnson in a television programme. They were confirmed by President Truman's announcement, Jan. 31, 1950, that he had instructed the atomic energy commission to continue work on the "so-called hydrogen or super bomb." Later, various scientists unofficially gave their opinion on how such a bomb could be constructed. Most were agreed that it would derive its energy by building up helium nuclei out of separate hydrogen atoms; since the total mass of the helium nucleus is less than the sum of the masses of the nuclei thus synthesised, the surplus mass would appear as free (explosive) energy. To effect the synthesis very high temperatures (of the order of millions of degrees centigrade) would be necessary, and it

was presumed that these would be supplied by an ordinary plutonium bomb acting as a detonator.

The building-up of helium from four nuclei of ordinary hydrogen is believed to take place in the centre of the sun, but by a catalytic process too slow for use as an explosive. Three alternative processes were therefore suggested as possible bases for the bomb: (1) production of light helium (helium-3) plus one neutron from two nuclei of deuterium (${}^2\text{H} + {}^2\text{H} = {}^3\text{He} + {}^1_0\text{n}$); (2) production of two helium nuclei from one nucleus of lithium and one of ordinary hydrogen supplied in the form of lithium hydride (${}^6\text{Li} + {}^1\text{H} = 2{}^4\text{He}$); (3) production of one helium nucleus from one nucleus of tritium and one of ordinary hydrogen (${}^3\text{H} + {}^1\text{H} = {}^4\text{He}$). The third of these nuclear reactions would release more than seven times as much energy, weight for weight, as uranium-235 or plutonium, and since no critical mass is involved, there would be no theoretical limit to the size of any one bomb. The main technical problem would appear to be that of keeping the hydrogen and tritium sufficiently concentrated during the fission of the detonator. It was also pointed out that tritium in any quantity can be made only at the expense of a corresponding quantity of plutonium; that the hydrogen bomb would necessarily be much more powerful than the plutonium bomb, and that the plutonium bomb was already too powerful for many military purposes.

Atomic Energy Act. Act of the U.K. parliament, 1946, which imposed on the minister of supply the duty of promoting and controlling development of atomic energy.

Attlee, CLEMENT RICHARD. British statesman. He ceased to be minister of defence, 1946, on appointing A. V. Alexander to the office. Attlee took prime responsibility for putting before parliament the treaty which gave dominion status to India and Pakistan in 1947. In Oct., 1948, April, 1949, and Jan., 1951, he presided over conferences of Commonwealth premiers or their representatives, held in London. At the general election of Feb., 1950, he was returned for Walthamstow W., continuing in office as prime minister. He flew to Washington in Dec., 1950, to confer with President Truman on the world situation.

Auriol, VINCENT (b. 1884). French president. Born at Revel, Haute-Garonne, Aug. 27, 1884, he was educated at Toulouse, where he practised as a lawyer. Socialist deputy for Haute-Garonne 1914-40, he achieved cabinet rank as minister of finance, 1936.



Later he was twice minister of justice under Blum. He was one of the 80 deputies who voted "no" when Pétain called on the chamber to surrender its powers, was arrested by Vichy police, and imprisoned in the château de Pellevoisin, Vals-les-Bains, and Aubenais, where he fell dangerously ill. Sent back to his home at Muret under house arrest, he escaped to London, 1943. He joined de Gaulle, and was a member of the consultative council in Algiers and in Paris, where de Gaulle appointed him minister of state in 1945. A member of the constituent assembly, he was elected its president in succession to F. Gouin, 1946, and was chosen, Jan. 16, 1947, first president of the fourth republic. He gave the position of president more importance in the constitution by new, but judicious, use of his powers. He and Mme. Auriol paid a state visit to the U.K., March 7-9, 1950.

Australia. Labour, confirmed in power in the 1946 elections, was defeated by the combined Liberal and Country parties in 1949, R. G. Menzies (*q.v.* in main text) forming a new govt.

The 40-hour week was established in 1947, with effect from Jan., 1948. The National Health Service Act, 1948, gave the govt. authority to develop medical, optical, and dental services. By the Bank Nationalisation Act of 1947, the federal govt. proposed to nationalise all private banks. Eleven banks, however, and the state govts. of S. Australia, Victoria, and W. Australia challenged the validity of the act under the federal constitution, and the decision of the Australian high court, declaring a number of sections invalid, was upheld by the privy council in London. The act was repealed in 1950. An act of 1949 conferred the federal vote on aboriginals, provided they were entitled to vote under state laws or had served in the defence forces. An act dissolving the Communist party of Australia was passed in 1950.

The foundation stone of a national university was laid at Canberra, Oct. 24, 1949.

During 1948-49, the Australian parliament voted two gifts of £A10,000,000 (£8,000,000) each to the U.K. as a contribution towards European reconstruction.

To carry through a scheme for diverting the upper waters of the Snowy river (which discharges into the Tasman Sea) through the Snowy mts. into the Murrumbidgee and Murray rivers the Snowy mts. hydro-electric authority was set up under an act of 1949. The undertaking involved the building of seven dams, 86 m. of tunnels, 550 m. of canals, and 16 power stations, and was est. to take 25 years to complete and to cost £200,000,000. It was to provide water for irrigation, as well as power, to Victoria and New South Wales.

By the end of 1949, the pop. of Australia exceeded 8,000,000.

Australian Flights. By 1950 the through service between the U.K. and Sydney (B.O.A.C. and Qantas Empire Airways in association) was operated by landplanes in a total time of 3½ days. Tasman Empire Airways operated a connecting link to Auckland, New Zealand, and British Commonwealth Pacific Airlines (with Pan American Airways) eastward from Sydney and Auckland. Canadian Pacific Air Lines provided a third trans-Pacific service.

Austria. The first elections in Nov., 1945, of an Austria once more independent gave 85 of the 165 seats in the lower house to the Communists. The second, Oct., 1949, gave 77 to the People's party, 67 to the Socialists, 16 to a new Union of Independents, and 5 to the Communists. In the upper house, members of which were nominated by the provincial Diets, the corresponding figures were 25, 20, 4, and 1.

The cabinet formed after the first election by Leopold Figl (People's party) continued in office. The federal president, elected Dec. 20, 1945, for six years, was a Socialist, Karl Renner (*d.* 1950). As both a former enemy and a liberated country, Austria was granted by the Allies rights not given to (*e.g.*) Germany: namely, the prompt recovery of sovereignty, and the right to re-establish diplomatic contacts. But she remained under Allied occupation, divided into four zones, Vienna being divided into four sectors.

Economic recovery was delayed by the stubborn refusal of the Kremlin to agree on Allied terms for a peace treaty, chief stumbling block being Russia's claim to all German assets in Austria (in which she included virtually everything that had come under Nazi control) and her confiscation of Austria's most valuable property, the oil wells at Zistersdorf.

Four currency reforms, cancelling pre-war debts and reducing and freezing others, had assisted economic recovery. That of Nov. 21, 1949, involved devaluation and the establishment of three different exchange rates according to the nature of the transaction involved.

The state of war with Austria was declared at an end by the U.K. Sept. 16, 1947, by Australia Oct. 7, 1948. See also European Recovery Programme in N.V.

Avalanche. A series of snow avalanches in the Alps of Switzerland, Austria, and Italy in Jan., 1951 the worst in the area since 1827 killed about 300 and did damages est. at £3,000,000.

Aycliffe, or Newton Aycliffe. Proposed new town in Durham co., England, planned as a satellite town for Darlington with a pop. of 10,000. The order for the new town was given by the minister of

town and country planning, April 25, 1947, under the New Towns Act of 1946. Lord Beveridge was appointed chairman of the Aycliffe development corporation.

Aylesford. The Carmelite monastery here, surrendered to the crown in 1538, was reopened in 1949. Aylesford has large paper mills.

Ayrshire. Under the 1948 redistribution of parl. seats Ayrshire had 5 co. constituencies (one of them including Bute).

Bahamas. A 25 years' agreement for the use by the U.S.A. and the U.K. of sites in the Bahamas as proving grounds for unarmed guided missiles was signed in Washington, 1950.

Bailey Bridge. In 1950 a Bailey bridge for foot passengers was built across the Thames by Royal Engineers, just above Hungerford Bridge, to link the left bank of the river with the Festival of Britain exhibition site.

Balanchine, GEORGES. Dancer and choreographer. In 1948 he became artistic director of the newly-formed New York City Ballet company, which made its first appearance in England in 1950.

Balchin, NIGEL MARLIN (b. 1908). British novelist. Born Dec. 3, 1908, he was educated at Dauntsey's school and Peterhouse, Cambridge, and in his subsequent career combined industrial psychology and authorship. During the Second Great War he acted as deputy scientific adviser to the army council. His best-known novels, marked by realism and sincerity, include *Darkness Falls from the Air*, 1942; *The Small Back Room*, 1943 (filmed, 1949); *Mine Own Executioners*, 1945 (filmed, 1948); *A Sort of Traitors*, 1949.

Baldwin, 2ND EARL. He resigned his post as governor of the Leeward Is. in 1950.

Balham. The parl. constituency of Balham and Tooting was abolished in the redistribution of seats in 1948.

Bamangwato. Tribe of the Bechuana. A dispute over the tribal chieftainship arose in 1949. The chief-designate, Seretse Khama, son of chief Sekgoma II, while studying law in England, married (1948) a white woman, Ruth Williams, and a tribal assembly in June, 1949, accepted Seretse as chief despite his refusal to give up his wife. His uncle, Tshekedi Khama, who since 1926 had acted as regent during Seretse's minority, and who with his supporters opposed the mixed marriage, thereupon announced that he and 44 headmen would go into voluntary exile, as he believed that the position of Mrs. Khama would lead to a breakdown of tribal administration.

A judicial commission was appointed to decide on Seretse's fitness to be chief, and when Mrs. Khama arrived in Bechuanaland in Aug.,

1949, she was treated as a private person. The findings of the commission were not made public, but in March, 1950, the British govt. announced its decision to withhold recognition of Seretse as chief of the Bamangwato for at least five years and to exclude him from the Bechuanaland protectorate, except by special permission, during that period. Clashes between supporters of Seretse and Tshekedi occurred in Serowe, the tribal capital, in April.

Seretse was allowed to go to Lobatsi to settle a dispute with his uncle as to an inheritance, and to visit his wife at Serowe April 16-21, and again May 16-June 12, after the birth of their daughter. In Aug. he was ordered to leave Bechuanaland, and with his wife and daughter flew to London. *Consul Sir Seretse Khama and the Bamangwato*, J. Mockford, 1950.

Barker, Sir Herbert. This British manipulative surgeon died July 21, 1936.

Bartlett, Vernon. This British politician and publicist retired from parliamentary life in 1950.

Baruch, Bernard Mannes (b. 1870). American economist. Born Aug. 19, 1870, at Camden, S.C., he was educated at the City college of New York. He entered finance and by 1912 was reputed to have amassed a fortune of 12-15 million dollars on Wall St. During the First Great War he was entrusted with complete charge over U.S. war production, and at Versailles was economic adviser to Pres. Wilson. In the Second Great War he was personal adviser to J. F. Byrnes as director of the office of war mobilisation 1943-45. In March, 1946, Pres. Truman appointed him U.S. delegate to the U.N. atomic energy commission, and in June Baruch submitted his country's proposals for international atomic control. These were eventually accepted as the basis for a report to the security council. Baruch resigned from the commission in Jan., 1947, having completed his task.

Barwani. This former state of central India was merged in Madhya Bharat, 1948.

Basildon. Proposed name for a new town of Essex, England, to be built under the New Towns Act, 1946, for a pop. of 50-60,000. The 7,000-acre site is near Pitsea.

Baudouin, Prince (b. 1930). Belgian crown prince, also styled duke of Brabant. Born Sept. 7, 1930, elder son of Leopold III and his first wife, Astrid, he was baptized Baudouin Albert Charles Leopold Axel Marie Gustave. During the Second Great War he was evacuated in 1940 first to France and later to Portugal, but subsequently returned to join his father at Laeken, near Brussels, during the German occupation. He lived either at Laeken or at Ciergnon, in the Ardennes, until the approach

of Allied forces in 1944, when the Germansevacuated the royal family first to Hirschheim, on the Elbe, and later to Strobl, Austria.

After liberation by U.S. forces in May, 1945, he lived with the rest of the family chiefly at Prégny, near Geneva, where he attended a private school. In 1948 he visited the U.S.A., and on July 22, 1950, he returned to Belgium with his father. On Aug. 1, the king delegated his powers to Baudouin, pending the Prince's accession to the throne on his 21st birthday.

Bautzen. At the end of the Second Great War this town of Saxony came within the Russian zone of occupation. A concentration camp established here by the Nazis was maintained in use by the Russians until Jan. 16, 1950. Handed over to the German ministry of the interior, it remained in use as a prison.

Baxter, A. Beverley. He became M.P. for Southgate, 1950.

Bayar, Celal (b. 1884). President of the Turkish republic. As a youth he entered the service of the Deutsche Orient bank, but soon turned his attention to politics. Joining the Nationalist party, he rapidly rose to prominence as a leader and loyal follower of Kemal Atatürk (*q.v.* in main text). Deputy for Smyrna (Izmir), 1923, Bayar was minister for reconstruction, 1924, but after a few months returned to banking. Appointed to the key position of minister of national economy, 1932, he was prime minister, 1937-39.

Forming the Democratic party, 1945, he was elected president of the republic after his party had obtained a majority in the grand national assembly by the general election of 1950. He succeeded Ismet İnönü (*q.v.* in main text).

B.C.G. This anti-tuberculosis vaccine (full name *Bacillus Calmette Guérin*) is a "live" vaccine prepared from a strain of tubercle bacillus which has been so attenuated that it has lost much of its capacity for producing disease. It has been widely used in France and in Scandinavia to protect persons liable to contract the disease, *e.g.* children of tuberculous parents and nurses in sanatoria. Controlled trials to last three years were begun in 1950 by the British medical research council.

Beasley, John Albert (b. 1895). Australian politician. Born at Werrilee, Victoria, Nov. 9, 1895, he sat in the house of representatives as Labour member for W. Sydney, 1928-46, becoming leader of the N.S.W. parl. Labour party, 1931, and of the federal Labour party, 1940. He served as asst. minister for industry and external affairs 1929-31; minister of supply and shipping 1941-45; and minister of defence 1945-46. In 1946, he became resident Australian minister in London, being appointed high commissioner the following year.

Beatty, 1st Earl. His bust, by Wm. Macmillan, R.A., was placed in Trafalgar Square, London, 1948.

Beggar's Opera, The. There was a further notable revival at Cambridge, and later in London, in 1948, the music for which was newly scored by Benjamin Britten.

Beira. Town of Mozambique. A 20-year agreement on the use of the port of Beira for Rhodesian trade was signed in Lisbon, June 17, 1950, by the U.K., Portugal, and S. Rhodesia. The Portuguese govt. was to maintain the port and the Beira rly. in a state of efficiency adequate for traffic to and from S. Rhodesia, N. Rhodesia, and Nyasaland; the U.K. and S. Rhodesia were to ensure the use of Beira for traffic for which that port is the natural inlet or outlet.

Belgium. The situation of Belgium after the Second Great War was better than that of any other of the occupied countries. She had suffered little destruction during the invasion of 1940, and the greater part of the country, including the capital, was liberated with great speed and little damage in Sept., 1944; while through the consequent presence on her soil of U.S. forces and her control of valuable minerals in the Congo she earned large sums in dollars. As a result, her immediate post-war recovery was rapid. But as her dollar reserves dwindled, unemployment increased; and the continued internal tension caused by the "royal question" had a deleterious effect on the country's life.

Leopold, in exile in Austria and later in Switzerland, refused to abdicate; but successive govts., aware of the hostility to him of a large part of the pop., were unwilling to invite him to return. In 1946 the king announced that he would be prepared to accept the result of a referendum. When the govt. reluctantly held a referendum on March 12, 1950, 57.68 p.c. of the votes were cast for the king; but the Socialists, who constituted a third of both houses of parliament elected in June, 1949, had declared that they would actively resist the king's return if the vote in his favour were less than 66 p.c. The govt., a Christian Social-Liberal coalition, resigned on March 18, and no leader could form a new cabinet. The Socialists were willing to accept Leopold's suggestion, broadcast in a recorded statement, that he should return, be restored to the royal honours, and then delegate his powers for a time to his eldest son Baudouin; but the king rejected their demand that he should leave the country again after the delegation. The prince regent, therefore, on the advice of the Christian Social leaders, dissolved parliament.

New elections on June 4, 1950, gave the Christian Social party in

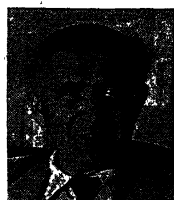
the house of representatives 108 (instead of 105) seats, the Socialists 76 (86), the Liberals 21 (29), the Communists 7 (12). The Christian Social party, which formed a new govt., also had a small majority in the senate. Despite the smallness of its majority, and the dangerously high feeling in the country, the new govt. called a joint meeting of the two houses of parliament which ended the regency and recalled Leopold. He arrived in Brussels July 22. Strikes and other demonstrations seemed to presage civil war; but on Aug. 1 Leopold agreed to delegate his powers immediately to his elder son Baudouin pending Baudouin's accession to the throne on his 21st birthday, Sept. 7, 1951. Disorders then ceased. *See also* Benelux (N.V.); European Recovery Programme (N.V.); North Atlantic Treaty (N.V.); Western Union (main text).

Belgrade. Capital of Yugoslavia. In 1948 work was begun on the building of a new city on the opposite side of the rivers Save and Danube from that on which the old capital stands. The new city, to house administrative departments, was planned for a pop. of 250,000.

Benelux. Term coined to designate Belgium, the Netherlands, and Luxembourg as a customs union, an agreement for which, concluded by the exiled govts. in London in 1944, was later ratified. Post-war differences in economic conditions within the three countries led to postponement of its fulfilment; but the intention to bring it eventually into effect continued.

Bengal, West. State (formerly province) of India. Pop. (1950 est.), 24,320,000.

Ben-Gurion, DAVID (b. 1886). Jewish politician. A native of Plonsk, Poland, he went to Palestine in 1900,



was exiled by the Turks, 1915, and became in the U.S.A. one of the organizers of the Jewish forces to fight against Turkey in the First Great War, serving himself in Allenby's Jewish battalion. A leading Zionist and trade unionist, he was general sec. of the federation of Jewish labour in Palestine, 1921-35, and a member from 1933 and chairman from 1944 of the executive of the Jewish agency and the world Zionist organization. He was prominent in the events leading to the formation of the Israeli state, 1948, and became its first prime minister and minister of defence. He wrote *We and Our Neighbours*, 1930, and *The Working Class and the Nation*, 1933.

Benthoscope. Under-water observation chamber. Closely resembling a bathysphere (*q.v.* in main text), it is designed to descend to a depth of about 10,000 ft., whereas the former does not usually go below 4,000 ft. A benthoscope which was lowered to a depth of 4,500 ft. (then a record), off the Californian coast, Aug. 16, 1949, was a steel sphere with a wall $1\frac{1}{2}$ in. thick and an outer diam. of $57\frac{1}{2}$ in. Two people could enter it through a 15-in. door, sealed with a rubber gasket; it had two windows of fused quartz. It was suspended from a barge on a steel cable attached to a winch.

Benue. This African river gave its name to a province of N. Nigeria formerly called after its chief town Nassarawa.

Bergius, FRIEDRICH. This German chemist died March 29, 1949.

Berkelium. Artificial, radioactive element, symbol Bk, at. no. 97, first produced in 1950 at Berkeley, California, by bombarding americium-241 with α -particles. Half-life, 4-8 hr.

Berkshire. In the 1948 redistribution of parl. seats Berkshire was divided into four co. constituencies, and Reading in addition was allotted two members.

Berlin. Four-power control of the former German capital, through an Allied *Kommandatura*, soon ceased to function harmoniously owing to the different intentions and methods of the U.K., the U.S.A., and France in the western sectors of the city, and of Russia in her eastern sector. Accentuated after the formation of the Socialist Unity party, the conflict became an open one when the mayor, Otto Ostrowski, joined that party and was forced to resign in April, 1947, by the Socialist, Christian Democrat, and Liberal majority in the city assembly. The Russian c.-in-c. refused to accept the Social Democrat, Ernst Reuter, elected as his successor; and the acting mayor Luise Schröder and the deputy mayor Ferdinand Friedensburg found themselves systematically frustrated by the Socialist Unity party, backed by the Russians, in their attempts at reconstruction in the devastated city, where 567,000 dwellings, with 2½ million living-rooms—43 p.c. of the pre-war total—had been destroyed during the war. Meetings of the *Magistrat* (executive committee) and the city assembly were increasingly subjected to external Communist-inspired interference and even violence.

Eventually the Russian members marched out of the Allied *Kommandatura*, March 20, 1948. When on June 18 the U.K., the U.S.A., and France announced their decision to introduce a reformed currency, the *deutsche Mark*, into their

zones from June 21, the Russians stopped all passenger trains and motor and foot traffic between their zone of Germany and the rest of the country at midnight, June 18-19, "as a protection against an influx of worthless currency"; and on June 24 they stopped goods trains also, under the pretext of technical trouble on the line. On the same day they introduced a revalued mark, under their exclusive control, into their zone, meaning to make it also the currency of all Berlin. The western powers prevented that by introducing the *deutsche Mark* in their sectors of Berlin. Eastern zone marks rapidly depreciated, since they were much less stringently controlled, the unofficial rate of exchange for one western mark fluctuating from $5\frac{1}{2}$ to 10 eastern marks; and the use of two currencies of differing value within Berlin created further strain in the city's economy.

The Russian Blockade, 1948-49

The Russian blockade would have meant starvation, or surrender to Moscow, for 2½ million Berliners in the western sectors if the U.S. and British authorities had not come to their rescue with the Air Lift (*q.v.* in main text), June 26, 1948-Sept. 30, 1949. An attempt to settle the conflict was made in Moscow, July-Aug., 1948, by the three western powers. Stalin agreed to the raising of the blockade, with a simultaneous acceptance for the whole of Berlin of the eastern mark, under four-power control. Subsequent negotiations in Berlin, however, lasting until Sept. 25, revealed that the Soviet authorities on the spot were not prepared to carry out this agreement. The dispute was therefore submitted to the U.N. security council, where the smaller powers unsuccessfully attempted mediation.

The elected city assembly, prevented by force by the Communists from sitting in the town hall (which lay in the Russian sector), moved to the British sector in Sept., 1948, without the Socialist Unity party members. Municipal elections held Dec. 9, in the western sectors, were not recognized by the Soviet authorities. Social Democrat, Christian Democrat, and Liberal candidates stood, the Socialists securing 64.4 p.c. of the votes on a poll of 86 p.c., of whom only 3 p.c. returned invalid votes. Next day Reuter was again elected mayor (he was again refused recognition by the Russians); Luise Schröder and Friedensburg were elected deputy mayors. Reuter's election was confirmed by the city assembly Jan. 14, 1949. On Nov. 30, 1948, the Socialist Unity party members of the city assembly (26 in number out of 130) met in the state opera house, elected Fritz Ebert, son of the first president of the Weimar republic, provisional mayor, and set up a provisional *Magistrat* which claimed responsibility for the whole of Berlin. This *Magistrat* took

over the town hall, and continued to function in the Soviet sector.

Negotiations in New York between the four powers involved led to the end of the blockade on May 12, 1949, but the air lift was maintained four months longer in order to build up stocks against its possible repetition. Minor sources of conflict continued to divide the city's Allied rulers; among them, alleged trespassing on both sides, kidnapping of western Berliners by the Russian-organized "people's police," a dispute over the payment of Berlin railwaymen. These men, though they served all Berlin, were paid in eastern marks, and to secure payment of at least part of their wages in western marks, they went on strike from May 20 to June 28.

During May-Sept., the western commandants in Berlin attempted in vain to bring about a reunification of the divided city. On Sept. 30 the W. German *Bundestag* passed a resolution advocating the inclusion of Greater Berlin in the W. federal republic; and on Oct. 8 the *Magistrat* of western Berlin applied to be admitted as the twelfth *Land* of the federation. The Allied high commissioners, though favouring close economic cooperation between W. Germany and W. Berlin, could not countenance such a development because of the possible repercussions in the Russian zone. With Allied approval, the W. German govt. made substantial grants to Berlin and supported its industry by placing orders with its factories.

Elections for the chamber of deputies in W. Berlin, Dec. 3, 1950, gave the Social Democrats 44.7 p.c. of the votes, and the largest number, but no longer an absolute majority, of seats. Social Democrats 61 (76); Christian Democrats 34 (26); Free Democrats 32 (17). The *Magistrat* was replaced by a senate of 16, based on the membership of the new chamber.

Bermudas. The use of motor vehicles, prohibited in 1908, became legal (with limitations) in 1946. In 1950 the Admiralty announced that for reasons of economy it had been decided to close Bermuda dockyard, one of the oldest British naval establishments overseas.

Bernadotte, FOLKE, COUNT. Swedish humanitarian. In 1950 the Israeli govt. agreed to pay £19,500 to the U.N. as reparation for the assassination of Bernadotte.

Berners, 14TH BARON. This English composer and author died April 19, 1950.

Bernhard, PRINCE. An Act of the Netherlands parliament, 1950, named Prince Bernhard as regent should Queen Juliana die before their eldest daughter Beatrix came of age.

Bevan, ANEURIN. This British politician became minister of labour and national service Jan., 1951.

Beveridge, WILLIAM HENRY BEVERIDGE, BARON. He was appointed chairman of the Aycliffe de-

velopment corporation in 1947, and of the Peterlee development corporation in 1949. The broadcasting committee of enquiry, 1949, of which he was chairman, issued its report Jan. 18, 1951.

Bevin, ERNEST. British politician. At the general election of Feb., 1950, he was returned for Woolwich, E. He retained his post as secretary of state for foreign affairs.

Bhopal. State of India. Pop. (1950 est.), 850,000.

Bible. In 1949 work was begun under an interdenominational committee on a new translation from the original languages into modern English. Represented on the committee were the Churches of England and Scotland, Methodists, Congregationalists, Baptists, English Presbyterians, the Society of Friends, the Churches in Wales and Ireland, the British and Foreign Bible Society, the National Bible Society of Scotland, and the Oxford and Cambridge university presses. See also Knox, R.A., in main text.

Bibliography, BRITISH NATIONAL. Official catalogue compiled by the British Museum, first pub. in 1950. Issued weekly and yearly, it lists books newly published in Great Britain. The responsible council was approved by the British Museum, Royal Society, Library Assoc., Publishers' Assoc., Booksellers Assoc., National Book League, and other bodies.

Bidault, GEORGES. French politician. His government was defeated on a vote of confidence, June 24, 1950, and he resigned. He was deputy premier in H. Queuille's ministry July 2-4, 1950.

Bihar. State (formerly prov.) of India. Pop. (1950 est.) 39,420,000.

Birkenhead. Under the redistribution of 1948 Birkenhead gave its name to a bor. constituency, but parts of it vote in Bebington bor. constituency.

Birkett, SIR WILLIAM NORMAN. This British judge was appointed a lord justice of appeal in 1950.

Birmingham, GEORGE A. This Irish author (Rev. James Hannay) died in London Feb. 2, 1950.

Black, JAMES MACDOUGALL. This Scottish ecclesiastic died Oct. 18, 1949.

Blamey, SIR THOMAS ALBERT. Australian soldier. He was promoted field-marshal 1950.

Bliss, ARTHUR. This British composer was knighted 1950.

Blum, LÉON. This French statesman died March 30, 1950, at his home near Versailles.

Bolivia. In July, 1946, Villaroel, dictator of Bolivia, was deposed and killed. A provisional govt. arranged a presidential election in Jan., 1947. Following a close vote and a recount, Enrique Hertzog was elected. Hertzog, at his inauguration, announced the formation of a socialist ministry. In 1949, Hertzog resigned on grounds of ill-

health, and the vice-pres., Mamerto Urriolagoitia, succeeded him. A military revolt in the southern provinces, led by the extreme right-wing "national revolutionary movement," was suppressed by govt. forces in Sept., 1949. A new govt. was formed Jan. 28, 1950, mainly composed of members of Urriolagoitia's party, the socialist republican union. The govt. declared the Communist party illegal April 11, 1950.

Bombay. State (formerly prov.) of India. Pop. (1950 est.) 32,680,000.

Bondfield, MARGARET. British politician. She was made C.H. in 1948. Her autobiographical book, *A Life's Work*, appeared 1949.

Bone, SIR MUIRHEAD. His brother James, mentioned in the same entry, was made C. H. in 1947, and pub. *London Echoing*, 1948.

Booth, EVANGELINE. Salvation Army leader. She died in New York July 17, 1950.

Boswell, JAMES. His private papers, including the MSS. of his *Life of Johnson* and *Tour of the Hebrides*, journals, and correspondence, were purchased by Yale University in 1949. His *London Journal, 1762-1763*, was pub. 1950.

Botwinnik, MIKHAIL (b. 1911). Russian chess player. Born in St. Petersburg (Leningrad) Aug. 17, 1911, he was a first class player at the age of 14 and in 1931 won the championship of the Soviet Union. He tied for first place with Capablanca in Moscow, 1935, and at Nottingham, 1936. In the first world championship after the Second Great War, 1948, Botwinnik gained the title, Max Euwe (Netherlands) and S. Reshevsky (U.S.A.) being among the runners-up.

Boucicault, DION. His daughter Nina (mentioned in the same entry) died Aug. 2, 1950.

Boulder Dam. See Hoover Dam in N.V.

Boulton, SIR ADRIAN. In June, 1950, he retired from the B.B.C. and became chief conductor of the London Philharmonic Orchestra.

Bourbon. The French National Assembly on May 16, 1950, abrogated the law of 1886 by which heads of French royal houses and their direct descendants were banished from France.

Bowley, ARTHUR LYON. This British economist was knighted 1950.

Bowra, CECIL MAURICE. This British scholar was knighted 1951.

Boysen Dam. Principal feature of irrigation works in Wyoming, U.S.A. Situated on the Big Horn river, north-central Wyoming, the dam, 220 ft. high and 1,000 ft. long, is designed to provide irrigation, generate power, and exercise flood control. Work began on it in 1946.

Bradbury, BARON. This British civil servant died May 3, 1950.

Bradford. Trams ceased running in this city of Yorks, 1950.

Bradman, Sir DONALD GEORGE. His book, Farewell to Cricket, was pub. 1950.

Braid, JAMES. This Scottish golfer died Nov. 27, 1950.

Bridie, JAMES. This Scottish dramatist (whose real name was O. H. Mavor) died Jan. 29, 1951.

Brigadier. In 1950 the title Brigadier replaced that of Senior Controller in the W.R.A.C.

British European Airways. One of the two British state-owned and state-operated commercial airways corporations. It was formed Aug. 1, 1946, to operate all British regular air services between the U.K. and the European continent, replacing the European division of British Overseas Airways Corporation, which had taken over the post-war continental services started by Transport Command, R.A.F. In 1947, the operation of all British internal air lines was also taken over by B.E.A., but from 1948 private companies provided certain services in association with B.E.A. For the period 1947-48 B.E.A. had an operating loss of £3,573,989; by 1949-50 this had been reduced to £1,383,594.

In 1949, B.E.A. aircraft carried 709,203 passengers, 4,829 tons of freight, 3,476 tons of mail, and covered a total mileage of 15,156,101. The strength of the corporation's fleet as at May 1, 1950, was 92 aircraft, with more than 50 replacements on order. Head office is at Keyline House, Ruislip, Middlesex.

British Road Services. General trading title of the services controlled by the road haulage executive of the British Transport Commission (*v.i.*). It had acquired by February, 1948, about 2,000 undertakings operating more than 40,000 motor vehicles, trailers, and horse-drawn vehicles. The loaded mileage operated exceeded 10,000,000 per week; the total staff was more than 66,000. For administrative purposes the U.K. is divided into nine divisions, which are themselves sub-divided into 31 districts, containing more than 300 groups. Each group is operated by a group manager, who has charge of about 200 vehicles. The head office is at 222, Marylebone Road, London, N.W.1.

British Transport Commission. Body responsible in the U.K. for the provision of public inland transport, except by air, and port facilities for passenger and goods traffic. Established as a public authority under the Transport Act, 1947, it has a full-time chairman, four full-time members, and one part-time member, first appointed by the minister of transport, 1948. The administration of the various services directed by the commission is delegated to six

public bodies: railway executive; London Transport executive; road haulage executive; road passenger executive; docks and inland waterways executive; hotels executive.

On Jan. 1, 1948, the main-line railways of Great Britain, together with their ancillary services, the smaller railway undertakings previously under the jurisdiction of the railway executive committee, the railways and road services formerly controlled by the London Passenger Transport Board, and various inland waterways specified in the Act were vested in the Transport Commission. Also under the Act, the commission acquired both privately-owned and municipally-owned omnibus, trolley-bus, tramcar, and motor-coach services. Road haulage undertakings, which in 1946 were engaged in the carriage of goods involving routes of 40 miles or upwards, and necessitating journeys beyond a 25-mile radius from the operating centre, were also taken over. Wide powers were granted to the commission to develop trade harbours in Great Britain and to maintain and improve the various services, including the building of hotels and hostels. The offices are at 55, Broadway, Westminster, London, S.W.1.

Brockway, ARCHIBALD FENNER. This British politician was returned as Labour M.P. for Eton and Slough at the general election of Feb., 1950.

Brown, WILLIAM JOHN. He failed to retain his seat at Rugby in the general election of Feb., 1950.

Bruneval. A memorial stone commemorating the combined operations raid of Feb. 27-28, 1942, when British and Canadian airborne troops destroyed the German radar station at Bruneval, was laid on the cliff edge by Gen. de Gaulle, March 30, 1947.

Buchenwald. This concentration camp near Weimar, Germany, was used by the Russian occupying forces after the Second Great War for political and other prisoners. Its closing was officially announced in Jan., 1950.

Budapest. On Jan. 1, 1950, under a new administrative plan, the suburbs were merged with the capital; this brought the pop. up to 1,600,000.

Bulgaria. On Oct. 3, 1949, Bulgaria denounced her twenty years' treaty of friendship and mutual assistance with Yugoslavia, made in 1947.

Ten members of the Communist party, including the former deputy premier, Traicho Kostov, were tried on charges of treason and espionage, Dec. 7-14, 1949. Kostov was condemned to death (hanged, Dec. 16); the others to terms of imprisonment.

The prime minister Kolarov died Jan. 22, 1950, and Vulko Chervenkov, secretary of the central

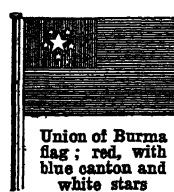
committee of the Bulgarian Communist party, was appointed to succeed him.

The Bulgarian Black Sea port of Varna changed its name to Stalin on Dec. 16, 1950, in honour of the Russian dictator's 70th birthday.

Bunche, RALPH JOHNSON (b. 1904). American professor and administrator. Born at Detroit, Aug. 7, 1904, the son of a Negro barber, he studied at the Univ. of California and at Harvard. At Howard Univ., Washington, D.C., he became instructor, 1928, and professor, 1938, of political science. In the Second Great War, he was in the office of strategic services and later the state dept.; and in 1946 he was appointed director of the U.N. division of trusteeship. In 1948-49 he was in Palestine, first under the U.N. mediator Count Bernadotte, then, after Bernadotte's assassination, Sept. 17, 1948, as acting mediator. Under Bunche's skilful handling, armistices were concluded between Israel and her Arab neighbours. For this work, he was in 1950 awarded the Nobel peace prize. In the same year he was appointed professor of government at Harvard.



Burma. Karen opposition to the govt. was the outcome of a desire for an autonomous Karen



Union of Burma flag: red, with blue canton and white stars

state; Communist opposition (which included the "white band" anti-govt. section of the people's volunteer organization, one of the groups in the wartime anti-fascist people's freedom league) was part of the general Communist unrest in S.E. Asia. The Karens were strongly anti-Communist, but nevertheless in north and central Burma they found themselves joined by Communist rebels.

In Aug., 1948, Karen troops mutinied at Thayetmyo and Mingaladon. Driven from those towns, they seized Promé, where there was no garrison, and recaptured Thayetmyo. There were also several clashes in the delta area, near Bassein, and near Syriam, 3 m. N. of Rangoon; and on Sept. 1 the Karens seized Moulmein in Tenasserim, on Sept. 14 Schweygün, some 70 m. up the Sittang, and Kyaukkyi, near Toungoo.

A commission to study regional autonomy was set up on Sept. 1, and fighting died down for a time, to revive towards the end of Dec., with special strength in the Irawadi

delta and in Tenasserim. During the last week of Jan., 1949, the insurgents took Toungoo and Pyu, and entered Bassein, but were driven out again. During Feb. they captured Insein (11 m. N. of Rangoon). Yamethin, Pymmana, Meiktila, Maymyo, Myingyan; and on March 16, after hard fighting, took Mandalay. Govt. forces retook Meiktila March 24, Mandalay April 3, Insein May 22. Yenangyaung, chief centre of the oilfields, seized by white-band troops on May 7, was recaptured by the govt. June 11. Prome and Toungoo remained in rebel hands until the following spring.

On July 19, 1949, Thakin Nu announced his intention to re-establish "peace within one year." By July, 1950, the insurgents had lost their hold on all large towns, though, driven into the hills, they still made communications unsafe. The "white-band" troops had come over to the govt.; and the Karens, promised an amnesty for all who laid down their arms, and an autonomous state in accordance with recommendations made by the regional autonomy commission, were beginning to come in in considerable numbers.

Economically, the country remained in a state of chaos. Rehabilitation of the British-owned oilfields, on which £10,000,000 (including £2,000,000 contributed by the British govt.) had been spent, was discontinued at the end of 1949, owing to the lawlessness of the oilfield area, and damage done to the installations and to the pipeline to Rangoon. In March, 1950, the govts. of Australia, Ceylon, Pakistan, and the U.K. offered a joint loan of £6,000,000 (the U.K. providing £3,750,000) to Burma, principally to finance the export of rice. The loan was accepted, and an agreement signed in Rangoon, June 28. In addition to her share of this loan, the U.K. had advanced to Burma since 1945 some £72,000,000, of which half was transformed into a gift by the treaty of 1947 giving Burma independence, and £1,000,000 had been repaid up to March, 1950.

Burroughs, EDGAR RICE. This American novelist died at his home, "Tarzana," Calif., March 19, 1950.

Burt, SIR CYRIL LOPOWICZ. In 1950 he retired from the professorship of psychology at University College, London.

Bustamante, ALEXANDER (b. 1884). Jamaican politician. Of mixed blood, he was born near Kingston, Jamaica, the son of a local planter, his original name being William Alexander Clarke. After working on a farm he went to Cuba, and then to the U.S.A., where he took the name of Bustamante. He returned to Jamaica in 1934, and set up a successful money-lending business. He entered political life in 1938, his fiery oratory and understanding of the

psychology of the coloured workers securing him a commanding position in the Labour movement. In the election of 1944, Bustamante's Jamaica Labour Party defeated the People's National party and Bustamante became prime minister and minister of communications. In 1948 he came to London to negotiate with the colonial secretary and was received by George VI. At the general election of 1949, Bustamante's party was returned to power with a reduced majority.

Butler, KATHLEEN TERESA BLAKE. British educationist. She died May 2, 1950.

Cable. In 1947 the U.K. govt. took over Cable and Wireless, Ltd., and the govts. of Australia, New Zealand, India, and S. Africa also acquired the overseas communications in their various territories.

Cadogan, SIR ALEXANDER. In 1950 he retired from the post of permanent representative of the U.K. in the United Nations. He received the O.M. 1951.

Californium. Artificial, radioactive element, symbol Cf, at. no. 98, first produced in 1950 at Berkeley, California, by bombarding curium-242 with α -particles. Half-life, about 2 hr.

Campbell, SIR RONALD IAN. British diplomatist. He was made a privy councillor, 1950, in which year he relinquished his post as ambassador to Egypt and retired from the diplomatic service.

Canada. Floods in the Fraser valley, British Columbia, May-June, 1948, caused more than £6,000,000 worth of damage, and temporarily destroyed all rail communication between Vancouver and the rest of Canada and the U.S.A. Even more damage—probably three times as much—was done by floods in S. Manitoba, April-May, 1950, when about a third of Winnipeg's pop. of 350,000 had to be evacuated, and direct rly. communication between Winnipeg and the U.S.A. was interrupted for a fortnight.

During 1948 uranium, already being worked near the Great Bear and Great Slave lakes in the N.W. Territories, was discovered also in N. Saskatchewan; while titanium, in the production of which India had previously had a virtual monopoly, was found in quantity in Quebec prov. near Lake Allard, about 400 m. N.E. of Quebec city.

Immigrants from Great Britain during Jan., 1946-March, 1949, numbered 115,000. The pop. of Canada (including Newfoundland, *q.v.* in main text) was est. at 13,728,000 in 1950.

Canada was a party to the North Atlantic treaty (*q.v.* in N.V.), 1949; and when the U.K. devalued the £ in Sept. of that year, Canada devalued her dollar by 10 p.c., giving the £ sterling a value of 3·08 Canadian dollars.

An act of the British parliament, the British North America Act

(No. 2), 1949, gave the Canadian parliament authority to amend the constitution without reference to London except in regard to matters assigned by the British North America Act, 1867, to provincial legislatures, and other existing rights since acquired by the provincial govts.

In the general election of 1949, the Liberal party increased the seats it won from 125 to 192.

W. L. Mackenzie King, prime minister of Canada for more than 21 years, died July 22, 1950.

Cancer. Announcements were made in 1949 by research workers in the U.S.A., concerning a blood test for cancer and the presence of fungi in cancer.

Cape Flights. A U.K.-Cape record was set up by Squadron Leaders H. B. Martin and E. B. Sismore, who flew out an R.A.F. Mosquito in 21½ hours., April-May, 1947. The regular services of B.O.A.C. and South African Airways terminate at Johannesburg, with connecting services within the S. African Union. B.O.A.C. route to the Cape is *via* W. Africa and the Congo. South African Airways operates the E. coast route.

Caproni. This Italian aircraft manufacturing company was wound up in 1950.

Captain. In 1950 the title of captain replaced that of junior commander in the W.R.A.C.

Cardiff. In 1947, Cardiff castle, and the adjoining gardens of over 300 acres, were given to the city of Cardiff by the marquess of Bute; and in 1949 a Welsh national college of music and drama was opened in the castle.

Carton de Wiart, SIR ADRIAN. British soldier. His book of memoirs, *Happy Odyssey*, was pub. 1950.

Cecil of Chelwood, 1st Viscount. His autobiography, *All the Way*, was published in 1949.

Censorship. From Jan., 1951, the British board of film censors indicated universal suitability by U; more suitable for adult audiences, A; for adults only, children under 16 being excluded, X.

Centime. This coin, one-hundredth part of a franc, was abolished in France in July, 1950.

Central Provinces. This former prov. of India became a state of the republic in 1950 called Madhya Union or Madhya Pradesh: pop. (1950 est.) 20,920,000.

Certificate. A general certificate of education, as recommended by the secondary schools examination council in a 1947 report, was introduced in 1951 as the only educational certificate granted by the ministry of education, replacing the former general schools and higher schools certificates. Examinations for the certificate, held annually in May, are taken towards the end of the school career by can-

didates from all types of schools and colleges, and may be taken by those who have left school. The minimum age is 16 years on Sept. 1 of the year of examination. Papers are at three levels—ordinary, advanced, and scholarship. All subjects are optional, and papers at different levels may be taken at the same examination or in different years. The certificate indicates which subjects have been passed and at what level; an advanced level pass may be granted on performance in a scholarship subject, and an ordinary pass in an advanced subject. The examination is mainly for those seeking university entrance or scholarships, or intending to enter the professions; and universities and professional bodies state the subjects and the levels in which passes are required for entrance. All pupils leaving school also receive a comprehensive and detailed school report, based on frequent internal examinations and on school record.

Channel Swimming. Gertrude Ederle's time was not beaten by a woman until Aug. 8, 1950, when Florence Chadwick (U.S.A.) swam from Cape Gris Nez to the South Foreland in 13 hrs. 23 mins.

Twenty-four entered for a Channel swimming competition, Aug. 22, 1950; seven men and two women completed the crossing, an Egyptian Hassan Abd El Rehim setting up a new record time of 10 hrs. 50 mins.

Charles. Belgian prince-regent. On July 20, 1950, the Belgian parliament passed a bill to end the regency and authorise the return of King Leopold. Charles then resumed his old title of count of Flanders.

Charles, SIR ERNEST BRUCE. British judge. He died May 3, 1950.

Cheadle. Under the 1948 redistribution of parl. seats, Cheadle gave its name to a co. constituency.

Chetwode, PHILIP WALHOUSE CHETWODE, 1ST BARON. British soldier. He died July 6, 1950, and was succeeded by his grandson Philip (b. 1937).

Chevalier, MAURICE. French actor. His autobiography, *The Man in the Straw Hat*, was pub. 1950.

Chiang Kai-shek. Chinese statesman and soldier. Under the new constitution of China he was elected the first president, 1948, but retired 1949. At the end of 1949, the whole of China being overrun by Communist forces, the nationalist govt. withdrew to Formosa, and on March 1, 1950, Chiang Kai-shek re-assumed the titles of president of China, and c.-in-c. of nationalist forces. See China, in N.V.

Chile. In Jan., 1946, an oilfield, the first to be discovered in Chile, was found in Tierra del Fuego. Its output more than provided for the needs of the country.

A trans-Andine rly. linking Salta in N. Argentina with Antofagasta, begun in 1922, was opened in 1948.

During 1947-48 diplomatic relations were broken with most Communist countries, and strong internal measures taken against Communism.

In pursuance of the policy announced in 1939, defining Chilean Antarctica as all lands between 53° and 90° W., Chilean scientific and military bases were set up, 1947, at Greenwich I. (S. Shetlands) and in Graham Land, within the area claimed by Great Britain. British protests and offer to place the matter before the international court of justice were disregarded, and in Feb., 1948, a small British naval force was sent to the area. In Sept., 1948, Chile set up a third base within the British Falkland Is. dependencies.

The U.K., Argentina, and Chile agreed not to send warships, except for customary routine movements, S. of lat. 60° during the Antarctic summers of 1948-51.

Women's suffrage was granted in 1948. Pop. (est. 1948) 5,715,717.

China. Under a new western-style constitution adopted by the national assembly at Nanking. Dec. 25, 1946, to come into effect a year later, the first general elections in Chinese history were held Nov. 21-23, 1947, in all areas not under Communist rule. The new national assembly then elected chose Chiang Kai-shek, April 19, 1948, first president under the new constitution.

The civil war, meanwhile, continued, the Communists being in effective control of most of Chahar, Shansi, Honan, Hopei, and Shantung provs. The long-drawn-out efforts to integrate Kuomintang and Communist leadership finally broke down March 7, 1947. On March 19 nationalist forces entered Yenai, for eleven years the Communist "capital"; they found it abandoned. The Communists, however, were consolidating their position in Shantung, and extending their grip on Manchuria. In April, they isolated govt. forces in Peiping (Peking), and by Feb., 1948, they held virtually all Manchuria outside the large cities. During the autumn of 1948, they thrust determinedly towards Nanking. Mukden fell to them in Oct., and they completed their conquest of Manchuria during Nov.

Nationalist forces, including high ranking officers, were now deserting wholesale to the other side, taking with them their arms, most of which came from the U.S.A. Indeed, it was estimated that 80 p.c. of the arms supplied by the U.S.A. to nationalist China found their way thus to the Communists, who promised liberty to any nationalist deserter in exchange for his arms.

The U.S. govt. had continued to send military help to Chiang so long as there seemed the least

hope that he might pacify his country. But during July-Aug., 1947, Lt.-Gen. Albert C. Wedemeyer, on state dept. instructions, visited the chief cities of China. He sent home a report that was highly critical of the situation in nationalist circles, and thenceforth military aid to Chiang was steadily reduced. At the end of Nov., 1948, Mme. Chiang flew to Washington in an attempt to secure immediate further substantial aid for the nationalists, but she was unsuccessful. Total grants and credits for military supplies given by the U.S.A. to nationalist China after V.-J. Day amounted to \$2,007,700,000; in addition she had sold to the nationalist govt. for \$232,000,000 surplus U.S. military stores worth more than a thousand million dollars. Over and above this military aid, nationalist China had received \$2,263,500,000 from U.N.R.R.A. and Canada.

Suchow was abandoned to the Communists on Nov. 30, 1948, and a month later the Communist armies stood along the left bank of the Yang-tse from the sea to central China. In a new year message, Dec. 31, Chiang expressed his willingness to enter into peace negotiations on certain conditions. On Jan. 14, 1949, Mao Tse-tung (q.v. in N.V.), the Communist leader, broadcast his conditions—surrender, abolition of the 1946 constitution, punishment of "war criminals" on a list published earlier, at the head of which stood the names of Chiang and his wife, and other unpalatable terms.

End of Chiang's Presidency
Tientsin fell on Jan. 15, 1949; on Jan. 20 Chiang resigned the presidency, and retired to his birthplace Fenghua, in Chekiang. The vice-president, Gen. Li Tsung-jen, assumed office as acting president, and announced his intention of sending a peace deputation to N. China. Peiping surrendered on Jan. 22, and three days later Mao agreed to receive the nationalist delegates in that city. Wrangling as to conditions and the status of the delegation followed. At the beginning of Feb. the nationalist govt. moved to Canton. Peace negotiations began at last on April 5, but among the Communists' terms was now a demand that their armies should be allowed to cross the Yang-tse without interference. This the nationalists were still refusing to accept when April 20, last day set by Mao for a settlement, arrived, and the Communists began a mass crossing of the river next day in the neighbourhood of Wuhu. On the 23rd they occupied Nanking, abandoned by the nationalists the day before. By then possibly a million Communists were pouring across the river. Chiang flew in to Shanghai on April 28, and placed himself once more at the head of the nationalist forces. On May 3 that city was encircled, and the

nationalists withdrew from Hankow, entered by the Communists on May 16. Shanghai itself fell, after a determined defence, on May 27. Nationalist resistance now virtually collapsed, and the Communists pushed southwards, took Foochow Aug. 17, and by the end of Aug. were on the borders of Kwantung prov. At the beginning of July, Chiang established his h.q. in Formosa.

In Sept. a Chinese people's political consultative conference met in Peiping. It chose Peiping capital of Communist China, and revived the name Peking. It also drew up a programme setting out the policy and methods of govt. of the people's republic of China, which was formally inaugurated Oct. 1 with Mao as chairman of the central govt. and head of state.

During Sept. the provs. of Suiyuan and Ninghsia (Inner Mongolia) and Sinkiang (Chinese Turkistan) went over to the Communists. Canton, from which the nationalist govt. went to Chungking Oct. 13, was occupied without resistance Oct. 15. Amoy and Swatow fell Oct. 17, and the Communists then moved westward, entering Chungking Nov. 30 a few hours after the nationalist govt. had left for Chengtu, 170 m. to the N.W. From Chengtu it flew, on Dec. 8, to Taipei in Formosa. During Dec. the governors of Yunnan and Sikang went over to the Communists, and by the end of the year the whole of the Chinese mainland, except some remote parts in the west, was under Communist control.

Russia recognized Mao's govt. Oct. 2, and her European satellites followed suit a little later. Burma, first non-Communist state to recognize it, Dec. 9, was followed by India, Pakistan, the U.K. (Jan. 5, 1950), Ceylon, Norway, Denmark, Israel, Finland, Afghanistan, Sweden, Switzerland, and the Netherlands. The U.S.A., though no longer aiding the nationalists militarily, did not recognize the Communist govt. Chou En-lai, premier and foreign minister in Peking, sent a formal letter to the sec-gen. of the U.N. on Nov. 18, 1949, repudiating the nationalist delegation at Lake Success, and demanding that it should be deprived of its status. The U.N. general assembly, then in session, took no action, and the continued presence in the security council and other U.N. bodies of representatives of nationalist China led Russia to boycott the U.N. until Aug., 1950, when her representative on the security council returned to take his seat as the month's chairman.

During Dec. 16, 1949-Feb. 14, 1950, Mao Tse-tung was in Moscow negotiating a 30-years' treaty of friendship and alliance under which Russia agreed not later than the end of 1952 to transfer to the Chinese govt. all rights in the

Changchun rly., and to withdraw her troops from Port Arthur and restore its installations to China; the status of Dairen was to be reconsidered when peace was concluded with Japan. Russia agreed also to grant China credits amounting to 300,000,000 U.S. dollars, one-fifth every year for five years from Jan. 1, 1950, repayment in raw materials, tea, gold, and American dollars in ten equal annual instalments to begin Dec. 31, 1954. The treaty signed by Russia with the nationalist govt. in 1945 was declared invalid. On March 27, 1950, an agreement for joint Sino-Russian exploitation of oil and non-ferrous metals in the prov. of Sinkiang was signed.

A law passed on April 13 abolished child marriage, polygamy, and concubinage, and permitted divorce by mutual consent. Pop. (1948) 463,500,000.

See also Korea in N.V. *Consult also* China Shakes the World, J. Belden, 1950.

Chipewyan. In 1950 a band of Chipewyans, the last remaining nomadic Indians in Canada, signed a treaty with the Canadian govt. agreeing to live in a reservation on the eastern fringe of the Rockies.

Chloromycetin. Antibiotic produced originally from a mould, *Streptomyces Venezuelae*. It was later prepared synthetically. Chloromycetin proved useful in that group of diseases caused by the Rickettsiae, organisms that lie between the viruses and bacteria: e.g. typhus, and some types of typhoid.

Christie, AGATHA. Her 50th detective novel appeared in 1950.

Chungking. Following the evacuation of Canton, Chungking was proclaimed the nationalist capital of China on Oct. 13, 1949, but the city was occupied by Communist forces on Nov. 30.

Churchill, WINSTON L. S. British statesman. He toured Europe and the U.S.A., 1945-46, receiving honours and ovations and making a series of important speeches on the international situation. At Fulton, Mo., March 4, 1946, he described the division of the world into democratic and Communist halves and first used the phrase "the iron curtain" to signify the European frontier between them; at Zürich, Sept. 19, he developed the theme of western unity, appealing to France to co-operate with Germany to form its kernel. With like-minded men of all parties, he founded the United Europe Committee, 1947, and became its chairman. In May, 1948, he presided at a congress of Europe, sponsored by movements with similar ideals, at The Hague. On March 31, 1949, at the Massachusetts institute of technology, he gave a wide survey of the technological and political developments in the first half of the 20th

century, with special reference to the international situation. As a member of the British delegation, he attended the first session of the consultative assembly of the council of Europe at Strasbourg, Aug., 1949. At the general election of Feb., 1950, he was again returned to parliament as member for Woodford and continued to lead the opposition.

Churchill was installed as lord warden of the Cinque Ports in Sept., 1946, and received the French médaille militaire, 1947. He had the freedom of Strasbourg conferred upon him in Aug., 1949, and was appointed deputy lieutenant for Kent, Dec., 1949. In Oct., 1948, appeared the first volume of his war memoirs, *The Gathering Storm*; later volumes, *The Finest Hour* and *The Grand Alliance*, appeared in 1949 and 1950 respectively. His paintings were exhibited at the R.A. summer exhibitions from 1948, when he was made Hon. R.A. Extraordinary.

Cinematography. Although handicapped by lack of equipment and a shortage of men, British films achieved both popularity and prestige towards the end of the Second Great War. But this prosperity induced an extravagance in production that did not always enhance artistic merit. By the summer of 1947 losses on production were high. At the same time, owing to shortage of dollars, the British govt. imposed a 75 p.c. import duty on foreign films in order to reduce the debt for films to the U.S.A. of close on £20 million a year. The American producers (dependent for their profits on overseas sales) were angered, and for a time stopped sending films. This removal of competition gave British producers a great opportunity that not all of them were able to take, and to ensure an adequate supply of films to distributors, the govt., after some months, removed the import tax but limited the dispatch of dollars to \$17 million in any one year. Earnings above that sum could be used for production in the U.K., but could be converted into dollars only to the amount earned by British films in the U.S.A.

The Cinematograph Films Act, 1938, was due to expire July, 1948, and a new act, in April that year, gave the board of trade power to vary, in relation to production, the quota of British first-feature films to be shown. The initial quota set at 45 p.c. of showing time could not be met, and was reduced a few months later to 40 p.c., in 1950 to 30 p.c.

To assist producers independent of the large companies, the govt. in Oct., 1948, constituted a co. with powers to raise £2½ million and make loans on commercial terms to distributors, who could finance producers; this co. was superseded

in April, 1949, by a corporation, with Lord Reith as chairman, set up by Act of parliament and permitted to lend another £2½ million. A "working party" that enquired into production costs reported in Nov. that the industry's most serious defect lay in inadequate planning; and recommended that its first aim should be to produce at least 2 mins. of screen-time per camera-day.

Civil List. On the marriage of Princess Elizabeth to the duke of Edinburgh, 1947, she was granted an additional sum of £25,000 a year out of the Consolidated Fund, and £10,000 a year was granted to the duke of Edinburgh. The king paid to the Consolidated Fund £100,000 saved by him from the civil list during the Second Great War, so that no additional charge on account of the marriage would be made on public funds for some years.

Clackmannanshire. Under the 1948 redistribution of parl. seats Clackmannanshire with E. Stirlingshire returned one member to parliament.

Clark, MARK WAYNE. American soldier. He was appointed chief of U.S. army field forces in 1949.

Cochran, SIR CHARLES. British theatrical manager. Awarded the legion of honour in 1950 for his services to the French theatre by presenting French plays and actors in England, he died Jan. 31, 1951.

Cockcroft, SIR JOHN DOUGLAS. This British physicist was awarded the legion of honour, 1950, in recognition of his war work and assistance to French scientists under his direction.

Collins, NORMAN R. British writer. He resigned his post of controller of television 1950.

Colonel. In 1950 the title colonel replaced that of controller in the W.R.A.C.

Colonial Development Corporation. British organization for the development of the resources and trade of colonial territories. Established by the Overseas Resources Development Act, 1948, and responsible to the colonial secretary, it was formed with a view to increasing the general productive capacity and trade of the British colonies, and for these purposes was empowered to borrow up to £110,000,000. It operates on commercial lines in close consultation with colonial govts. By Nov., 1949, it had 28 fully operational undertakings in hand, including projects as diverse as poultry farming in the Gambia, timber extraction in British Guiana, cement manufacture in Northern Rhodesia, and sealing in the South Atlantic. The offices are at 33, Dover St., London, W.1.

Columbia University. A synchro-cyclotron, constructed for the university in 1948 at Irvington,

N.Y., was formally dedicated by Gen. Eisenhower in May, 1950.

Commander. In 1950 the titles chief commander, senior commander, and junior commander in the W.R.A.C. were replaced by lieutenant-colonel, major, and captain respectively.

Commons, HOUSE OF. The new chamber was completed in 1950, the house meeting there for the first time on Oct. 26.

Communist Party of GREAT BRITAIN. In the general election of Feb., 1950, 100 Communist candidates polled only 91,815 votes between them, and failed to secure any seats.

Company Law. The Companies Act, 1947, made many amendments in the law relating to companies, and in 1948 a consolidating companies Act was passed incorporating these amendments. The following are the most important changes: minority shareholders are protected, and in particular the court may, on the petition of any member who complains he is oppressively treated, make an order for the acquisition of the shares of the minority; holding companies must, with some exceptions, present group accounts covering the company and its subsidiaries; the auditors' duties are extended and only qualified accountants may act; except in private companies, directors must be voted on individually, unless a resolution that two or more be elected is first unanimously passed; directors must retire at 70 (except in certain companies) unless the articles of the company fix some other age limit which may be either higher or lower; directors must not be paid "free of tax"; a register of directors' shareholdings must be kept; the powers of the board of trade to inspect the affairs of a company are increased, and the board may also investigate the ownership of shares or debentures.

Compton, DENIS CHARLES SCOTT (b. 1918). English cricketer. This Hendon man, who was born



May 23, 1918, and worked on the staff at Lord's, attracted notice when 18 by scoring 1,000 runs in his first season with the Middlesex team. He was picked against

New Zealand in 1937, and made a century next year in his first test match against Australia. After service in India during the Second Great War, he went on the Australian tour of 1946-47, scoring a century in each innings of the Adelaide test. His book, *Testing Time for England*, tells of those matches. In 1947, showing himself one of the best stroke players ever

seen, he broke all records with an aggregate of 3,816 and a total of 18 centuries. His average was 90; the month of August alone brought 1,195 runs; and he figured in huge partnerships with W. J. Edrich. He also took 73 wickets with slow left-arm deliveries and was a speedy fieldsman near the boundary. He was vice-captain of the test team that went to Australia 1950-51. Compton was an Arsenal footballer from the 1935-36 season. His brother Leslie (b. Sept. 12, 1912) kept wicket for Middlesex and was centre-half for Arsenal. Both Denis and Leslie Compton were in the Arsenal team which won the F.A. cup in 1950.

Compulsory Military Service. For later information see Military Service in main text and N.V.

Congo. Plans for a military base and training centre for airborne troops at Kamina, on the rly. from Elizabethville to Port Franqui, were adopted by the Belgian govt., 1948.

Coorg. State of India; pop. (1950 est.) 170,000.

Corfu, CHANNEL OF. The incident referred to in the main text as the first matter brought by the U.K. before the U.N. security council was the damaging of two British destroyers, *Saumarez* and *Voltage*, in the Corfu straits, Oct. 22, 1946. Both ships struck mines, with casualties one officer and 37 ratings killed, and two officers and 43 ratings injured. Shortly after the incident a number of German-made mines were swept up, apparently laid only a short time before. As Albania had protested against the alleged infringement of her territorial waters by British warships and had refused to cooperate in mine-sweeping in the area, the British govt. held Albania responsible for the damage and demanded compensation. On the rejection of this claim, the U.K. laid the matter before the security council, Jan. 20, 1947. A month later the council considered a resolution inculpating Albania, but the resolution was vetoed by the U.S.S.R. The dispute was then referred to the international court of justice, where the hearing opened in Feb., 1948. In the judgement given April, 1949, the court held Albania responsible for the mining of the two destroyers, but was unable to assess compensation owing to lack of information. After Dutch naval experts had examined the warships, the court on Dec. 15, 1949, awarded damages of £843,947 against Albania.

Cori, CARL FERDINAND (b. 1896). Austro-Czech-American pharmacologist and biochemist. Born at Prague (then in Austria-Hungary), Dec. 5, 1896, he was educated at Trieste and at Prague university, and became a doctor of medicine. During 1922-31 he was on the staff of the state institute for the study of malignant diseases at Buffalo, N.Y., and was asst. pro-

fessor of physiology at Buffalo, 1930-31. Thence he went to Washington university school of medicine, St. Louis, Mo., as professor of pharmacology. With his wife Gerty Theresa Radnitz (b. in Prague, Aug. 15, 1896) he specialised in research on carbohydrate metabolism, insulin, adrenalin, phosphate metabolism of muscle, radioactive isotopes, etc. For this work they were together awarded half the Nobel prize for medicine, 1947.

Cork. Co. of Eire. In 1947 the co. (excluding Cork city) was divided into four constituencies sending twelve representatives to the Dáil.

Coronation Stone. This was stolen from Westminster abbey Dec. 25, 1950.

Corrective Training. Scheme for the rehabilitation of criminals in England and Wales. Under the provisions of the Criminal Justice Act (1948), a court has the power, in respect of an offender who is by age and previous convictions eligible for such a sentence under section 21 of the Act, to pass a sentence long enough to enable him to receive such constructive training as may divert him from crime and fit him to occupy a useful place in society after release. Training of this kind is carried out at regional training prisons, and aims at providing maximum opportunities for prisoners to exercise self-determination and responsibility. There are vocational training classes and an active educational programme.

Cortisone. A hormone first isolated from the suprarenal gland in 1941, used as treatment for rheumatoid arthritis. This substance plays an important part in the adaptation of the human organism to "stress." It had long been thought that there was a relationship between that crippling and chronic form of rheumatism known as rheumatoid arthritis and failure of adaptation to "stress." It was common knowledge that rheumatoid arthritis was frequently precipitated by emotional factors, and existing arthritis aggravated by similar circumstances. In 1949 an American physician, P. S. Hench, attempted to treat a number of these patients with cortisone, with most spectacular results. Unfortunately it was found that the improvement was only temporary and of short duration. Further doses of the drug had to be given at regular intervals, with a tendency for the patient to become progressively resistant to its beneficial effect. Larger doses produced disagreeable and even dangerous side effects—namely a considerable increase in the blood pressure. Scarcity and great cost of the drug limited experiment.

A later discovery, adreno-cortico-tropic hormone (A.C.T.H.), obtained from the pituitary gland, by stimulating the production of

cortisone from the suprarenal, had a similar therapeutic effect. Use of these drugs greatly advanced knowledge of the disease mechanisms involved in rheumatoid arthritis and allied conditions.

Costa Rica. In the presidential elections of Feb., 1948, the government-sponsored candidate, R. C. Guardia, was defeated by O. Ulate, of the opposing National Union party, but Pres. Picado and the govt. annulled the election. Civil war broke out the following month, when Col. J. Figueras, who had fought in the Spanish civil war on the govt. side, led a rebel army in support of Ulate, and by March 13, when martial law was proclaimed, was in control of the town of San Isidro. Repelling govt. attempts to defeat him, he soon dominated all the southern part of the country. By April 20 he was at the gates of San Jose, the capital. The president surrendered, resigned on condition that Leon Herrera was made acting president, and left for Nicaragua with Guardia. Herrera formed a provisional govt. with Figueras as foreign minister and minister of justice and public security. Thenceforward the country was governed by a revolutionary junta, pending the drafting of a new constitution. The official army was disbanded. In Dec., 1948, the govt. protested that Nicaraguan forces had joined in a minor armed insurrection supporting the former govt. Nicaragua denied this, and the treaty of Rio de Janeiro was invoked; the council of the organization of American states, after investigation, absolved Nicaragua.

A new constituent assembly was elected in Dec., 1948, in which Ulate's National Union party had a large majority. On Jan. 19, 1949, Ulate was made president of Costa Rica. Pop. (est. 1947) 747,000.

Costello, JOHN ALOYSIUS (b. 1891). Irish lawyer and politician. Born June 20, 1891, he was educated at the Christian Brothers schools and at University Coll., Dublin. He was called to the bar in 1914, and became attorney-gen. in the Cosgrave govt. of the Irish Free State, 1926-32.

More than once he represented the Irish Free State at the League of Nations, also at Imperial conferences in London, 1926, 1929, 1930. As a member of the Fine Gael party he sat in the Dáil for co. Dublin 1933-37, and for Dublin Townships 1937-43 and again from 1944. As a result of the general elections of 1948, E. De Valera's Fianna Fáil party, though remaining the strongest, was in a minority against the other parties, which combined to form a coalition with Costello as

taoiseach (prime minister). See Eire (N.V.).

Coudenhove-Kalergi, RICHARD, COUNT. In May, 1950, he was awarded by the city of Aachen (Aix-la-Chapelle) its first "Charlemagne prize" for his pioneer work for European union.

Countryman, THE. Quarterly periodical. The founder, J. W. Robertson-Scott, retired from the editorship in 1947, being succeeded by John Cripps, a son of Sir Stafford Cripps.

County Court. The maximum number of county court judges was increased to 65 by the High Court and County Court Judges Act, 1950.

Cripps, SIR (RICHARD) STAFFORD. He resigned the post of chancellor of the exchequer on account of ill-health, Oct. 19, 1950, when he also gave up his parliamentary seat at Bristol. He was created C.H. 1951. *Consult* Life, E. Estorick, 1949.

Crystal Palace. The remaining buildings were destroyed by fire on the night of Oct. 24, 1950.

Cumberland Lodge. In 1947 this was presented by the king as a residence for the S. Katherine's Foundation, a body whose purpose is to provide a college based on Christian faith and philosophy.

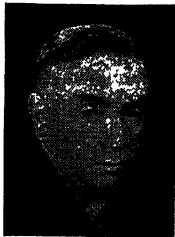
Cutch. State of India. Pop. (1950 est.) 550,000.

Cuzco. This ancient city of Peru was severely damaged by an earthquake, May 21, 1950.

Cyprus. A new constitution for Cyprus had been under discussion since 1946, and a consultative assembly was set up towards the end of 1947 to make recommendations. Nothing, however, was done until in May, 1948, certain proposals were sent to the governor, Lord Winster, by the British govt. These were rejected by Greek left-wing representatives on the assembly, which was dissolved. Meanwhile political discontent on the island was rife, the strength of anti-British movements being fomented not only by Communists but by those who wished Cyprus to be ceded to Greece. In Nov., 1948, Lord Winster, governor and c.-in-c. from 1946, announced his resignation on the grounds that efforts to secure acceptance of the constitution offered to the island had proved unavailing. He was succeeded by Sir Andrew Wright. At the municipal elections of May, 1949, approx. 60 p.c. of the electorate voted for the Nationalists and 40 p.c. for the Communists. Both parties demanded union with Greece.

The last of the 35,000 Jews detained by the British in Cyprus were released and sailed for Haifa in Feb., 1949.

The eradication of malaria from Cyprus was announced in Jan., 1950, after a three-year campaign to rid the island of the mosquito.



Czecho-Slovakia. The constituent assembly elected May 26, 1946, reflected the composition and interests of the Czecho-Slovak people. But the Communists, though not in a majority, were the strongest group, and in Feb., 1948, they staged mass demonstrations and created "action committees" which seized opposition papers and party headquarters. At the same time conflict within the coalition cabinet led to the resignation of most of the non-Communist members, many of whom took refuge abroad. Jan Masaryk, foreign minister and son of the founder of the republic, died March 10, 1948, apparently by suicide, and was succeeded by his Communist deputy Vladimir Clementis (who had been in London during the Second Great War and was himself forced to resign March 14, 1950). A new constitution on Communist lines was unanimously adopted May 9, 1948; and the constituent assembly continued the nationalisation programme by passing legislation exempting only business concerns employing 50 or fewer workers. By 1950 all but 3 p.c. of Czech industry was under state control. The name of Zlin, which owed its importance to the great shoe industry founded by Bata, was in Nov., 1948, changed to Gottwaldov; the Bata works became the Swit (dawn) factories.

At elections for a national assembly held on May 30, 1948, joint electoral lists gave little opportunity for expression of opposition except by leaving ballot papers blank—a step taken by 10.8 p.c. of voters. President Benes, embittered by the death of Masaryk, and by his having been forced in 1947, under Moscow pressure, to withdraw his country's adherence to the Marshall plan, announced his resignation June 7, 1948, two days before he was due to sign the new constitution. Already ailing, he died the following Sept. 3. The Communist prime minister Klement Gottwald was chosen, June 14, to succeed him, and appointed the Communist Antonin Zapotocky as premier.

On Oct. 25, 1948, forced labour camps for dissidents were instituted. From Feb. 1, 1949, trial by jury was abolished, and a new legal system under state control was introduced. A campaign to break the resistance of the churches led to the arrest during Sept. and Oct., 1949, of many clergy of all denominations. The R.C. primate, Archbishop Beran, and other high dignitaries were made virtual prisoners in their homes; and March 16, 1950, when the last papal official, the nuncio's secretary, was expelled, brought a complete breach with the Vatican. Only those clergy were allowed to continue in their offices who took an oath of allegiance to the govt. Hundreds of clergy and laymen were brought to trial for "treason" before the new courts; many were sentenced

to death and executed, others were condemned to long terms of imprisonment. Even some Communists were not spared—they were charged with "Titoism"; and numerous officials, especially in the diplomatic and consular service where they had had contact with the West, resigned, some escaping abroad.

The regulations governing the Czecho-Slovak armed forces were brought into line with those of Russia from Oct., 1950; among changes was one which made it the duty of the rank and file to report inefficiency in their officers.

Of the 35,000 Jews remaining in Czecho-Slovakia after the war, 23,000 had by Oct., 1949, gone to Israel, or put their names down to do so. Attempts to persuade some of the skilled citizens of German descent expelled 1945–46 to return were unsuccessful.

Dáil Éireann. In 1947 the number of deputies was increased to 147.

Dale, Sir Henry H. British physiologist. Having been president of the Royal Society, 1940–45, and director of the Royal Institution labs. 1942–46, he was elected president of the British Council in 1950.

Dalhousie, Earl of. The 15th earl died May 3, 1950, and was succeeded by his brother Simon (b. 1914).

Dalton, Edward Hugh John Neale. British politician. When the Labour cabinet was re-formed after the general election of Feb., 1950, he became minister of town and country planning. The duties of this office were enlarged, and the title changed to minister of local govt. and planning, in Jan., 1951.

Damodar. Late in 1948 the Indian parliament passed an act to promote the development of the Damodar valley for irrigation, hydro-electric power, etc. The project was to be administered by the central Indian govt. in conjunction with the govts. of the states of Bihar and W. Bengal.

Damrosch. Walter Johannes Damrosch died Dec. 22, 1950.

Darre, Richard Walther. German politician. He was released by the U.S. occupation authorities in Germany, Aug. 16, 1950, on grounds of good behaviour.

Davis, Joe. British billiards player. He equalled Lindrum's snooker break of 141 on Jan. 1, 1949; the record was broken, Feb. 3, 1950, by George Chenier who made a break of 144.

Deakin, Arthur. He was made a C.H., 1949.

Deeping, George Warwick. This British novelist died at Weybridge, April 30, 1950, in which year his novel *Old Mischief* was published.

Deir Yasin. Former Arab village of Palestine. It lies near the Tel Aviv-Jerusalem road, a few m.

W. of Jerusalem. During the night of April 9–10, 1948, it was seized by Irgun and Stern Gang terrorists. Bodies of 254 Arabs (including 145 women and girls) were found; over 100 other villagers were missing. Hagana dissociated itself from this atrocity.

Delhi. State (formerly prov.) of India. Pop. (1950 est.) 1,510,000.

Denman, Lady. This British organizer was created G.C.B., 1951.

Derby Stakes. The winner of the 1950 Derby was Galscador, owned by Marcel Boussac.

De Valois, Ninette. Her ballet, *Don Quixote*, was produced at Covent Garden by the Sadler's Wells company in 1950. She was created D.B.E. 1951.

Development Councils. Name introduced by the Industrial Organization and Development Act, 1947, for bodies authorised by that Act, to be set up for individual industries, with functions similar to those of joint advisory councils, but with extended powers covering research, design, etc.

Devonshire, Earl and Duke of. The 10th duke died at Compton Place, Eastbourne, Nov. 26, 1950. His younger son, Andrew Robert Buxton Cavendish (b. 1920) succeeded as 11th duke, the elder having been killed in action, 1944.

Dietrich, Otto. German politician. He was released by the U.S. occupation authorities in Germany, Aug. 16, 1950, on grounds of good behaviour.

Disease, Notification of. Leprosy was made a notifiable disease in the U.K. in 1949.

Displaced Person. Responsibility for about 85,000 displaced persons still in W. Germany passed to the *Länder* govts., June 30, 1950. The I.R.O. was kept in being until March, 1951, to care for about 113,000 persons waiting to go abroad.

Divorce. An order-in-council decreed that no proceedings under the Matrimonial Causes (War Marriages) Act, 1944, could be taken in respect of a marriage celebrated after June 1, 1950.

Jurisdiction. The Matrimonial Causes Act, 1950, gave the court in England jurisdiction in proceedings by a wife for divorce or nullity, even though husband and wife are not domiciled in England, if the wife has resided in England for three years and the husband is not domiciled in any other part of the United Kingdom, in the Channel Islands, or the Isle of Man. A similar rule applies in Scotland for wives resident there for three years.

Donegal, Co. of Eire. In 1947 the co. was divided into two constituencies, sending seven representatives to the Dáil.

Douglas, Lewis Williams. U.S. diplomat. In 1950 he resigned the ambassadorship to the U.K.

Dramamine. Drug used to relieve motion sickness (sea-sickness, etc.). It is related to the so-called anti-histamine drugs, and its effectiveness in motion sickness was noticed by chance. A certain patient under treatment at the Johns Hopkins allergy clinic, U.S.A., for hay fever with dramamine, who was highly susceptible to car-sickness, found this latter condition relieved in addition to his hay fever. Dramamine was used with complete success by 1,374 men in a U.S. army transport on an 11-day crossing of the Atlantic in Nov., 1948, and became a recognized specific for seasickness.

Drury Lane Theatre. The musical play *Oklahoma* ended its run here in May, 1950.

Dublin. City of Eire. In 1947 the city was divided into six parl. constituencies, returning 24 members to the Dáil.

Duhamel, GEORGES. French author. His autobiography, *Light on My Days*, English trans. B. Collins, was pub. 1948.

Dulanty, JOHN WHELAN. Irish diplomatist. His title of high commissioner in London was changed to that of ambassador, July 26, 1950. He retired in Sept.

Dumbarton. Under the 1948 redistribution of parl. seats, this burgh became part of the co. constituency of W. Dumbartonshire.

Dunster. The historic castle here was sold to the commissioners of crown lands in 1950.

Durban. See Africa in N.V.

Efficiency Medal (Territorial). Medal awarded to warrant officers, n.c.o.s, and men of the Territorial and auxiliary military forces of the British Commonwealth. Instituted Aug. 23, 1930, it replaced the Territorial Efficiency Medal. The Efficiency Medal (Territorial) is granted for 12 years' efficient service, provided 12 annual camps have been attended. Cadet service is credited for the award, while service in W. Africa and during war-time counts as double.

Oval in shape, the medal is of silver, and carries on the obverse the royal effigy and on the reverse the inscription "For efficient service." A subsidiary title on the mount denotes whether it is awarded for service in the Territorial army or in one of the other auxiliary military services. Clasps are granted for each additional completed six years of service. The ribbon is green with narrow yellow edges, but recipients whose service was in the H.A.C. wear the special ribbon described under Territorial Efficiency Decoration in main text.

Einaudi, LUIGI (b. 1874). Italian economist, second president of the Italian republic. Born in Piedmont, he became professor of science and finance in Turin university, and was for many years

economic editor of the *Corriere della Sera* and editor of *Riforma Sociale*, 1900-35, achieving a reputation as an economist far beyond his own country. He became a Liberal member of the senate in 1919. Opposing the war against Abyssinia in 1935, he was exiled by the fascists, whose economic theories he had also criticised. Until the end of fascism in Italy he resided in Switzerland. Returning 1944, he was appointed governor of the bank of Italy, and became a member of the constituent assembly, and in 1947 vice-premier and minister of finance. On the retirement through ill-health of Enrico de Nicola, first president, Einaudi was elected to fill his place, and took office May 12, 1948.

Eire. An application by Eire to join the United Nations was vetoed by the U.S.S.R. in Aug., 1947. Trade and financial talks with the U.K. were held in London, Nov., 1947, and a four-year trade agreement was signed in London, June, 1948. In general elections held in Feb., 1948, after a redistribution of seats in 1947, the govt. party, Fianna Fáil, remained the strongest party, with 68 seats, but it was in a minority of 11 as compared with the combination of all other parties. As De Valera, its leader, had already stated that he would not enter any coalition, representatives of other parties agreed to combine in a coalition under J. A. Costello, of the Fine Gael party, next strongest with 31 seats. Costello took over the premiership Feb. 18. His ministry included representatives of Labour and of Clann na Poblachta (New Republicans). The most notable measure proposed by the new govt. was the repeal of the External Relations Act of 1936 in order to sever the last remaining links with the British crown and the British Commonwealth.

After discussions with the premiers of the Commonwealth, in London for the Commonwealth conference of Oct., 1948, of the problems arising from such a step, which appeared to reduce all citizens of Eire in the U.K. and the Commonwealth, and British or Commonwealth citizens in Eire, to the status of aliens, the measure was duly brought forward in the Dáil as the Republic of Ireland bill; but this was accompanied by a declaration that in view of the historical associations of the countries concerned a new distinction would be made in favour of U.K. and Commonwealth citizens in Eire so that they should lose no existing privileges, provided that reciprocal gestures were made towards citizens of Eire in the U.K. and Commonwealth countries. The British govt. gave the required assurances, as did other Commonwealth countries, and general good will was expressed on all

sides with hopes for a more real friendship than before between the U.K. and Eire. Yet the position was not accepted in the U.K. without misgiving, first, as to the possible effect of such a precedent upon other countries of the Commonwealth which might at some time wish to break with the British crown; and secondly, as to the reaction upon other nations of a step that gave a non-Commonwealth nation the favour of special treatment on no stronger basis than that of long historical association. The govt. of Northern Ireland, too, had misgivings, and sought assurance from the British govt. that its independence from Eire would not be affected.

The Republic of Ireland Act was duly passed by the Dáil, Dec. 21, 1948, and came into operation at midnight, April 17-18, 1949.

Pop. (1946) 2,955,107.

Eisenhower, DWIGHT DAVID. In Dec., 1950, this U.S. soldier was appointed by the N. Atlantic council supreme Allied commander in Europe. He took up his duties in the following month.

Elbing. The Polish name of this town of Masuria, Poland (formerly in E. Prussia) is Elbląg.

Elizabeth. This princess of Great Britain gave birth to a daughter, Anne Elizabeth Alice Louise, Aug. 15, 1950.

Eritrea. The U.N. assembly political committee on the future of Eritrea recommended, Nov. 25, 1950, that the country should become a federal unit under the crown of Abyssinia (Ethiopia).

Europa. This former German liner made her first voyage, after refitting, as the *Liberté* in Aug., 1950, sailing from Havre to New York via Southampton.

Europe. The most striking fact during the years immediately following the end of fighting in Europe was the increasingly rigid division of the Continent into two—a western part composed of France, the Low Countries, Scandinavia, and Italy, with the U.K., and an eastern part of countries within the Russian orbit, Poland, Rumania, Hungary, Bulgaria, and Czechoslovakia. Yugoslavia, at first a leading member of the second group, was expelled from the Cominform (*q.v.* in main text) in 1948 because Marshal Tito refused to follow Russian orders in the post-war reconstruction of his country. Greece, after five years of civil war, succeeded in retaining her contact with the west. Spain remained in isolation apart from both groups.

In one after another country of eastern Europe, a minority Communist party, backed by Russian pressure, seized power and forced on its fellow citizens one-party, secret-police govt. and communist economic development. In the west also, but by way of

discussion and agreement, there was a growing tendency towards economic and, to some extent, political integration.

The first step in this direction by the west was taken during the war, when in 1944 the exiled govts. of Belgium, the Netherlands, and Luxembourg reached agreement for an eventual customs union of their three countries. This agreement was fully supported by the new govts. formed at home after the expulsion of the Germans (though differences in internal economic conditions caused its implementation to be deferred), and in international affairs the Benelux countries, as they came to be called, frequently spoke and acted together.

The Treaty of Dunkirk

A 50-year treaty of alliance between the U.K. and France was signed at Dunkirk, March 4, 1947; a 50-year treaty of mutual assistance and economic cooperation between the U.K., France, and the Benelux countries, signed at Brussels March 17, 1948, brought into being Western Union, with a permanent consultative council composed of the foreign ministers of the participating countries (to meet at least every three months), a permanent commission of diplomatic representatives (to meet at least once a month), and a permanent military committee to keep defence problems under review.

A committee appointed by the consultative council of Western Union studied proposals by both unofficial and official bodies supporting European unity, and as a result of its report the consultative council announced, Jan. 28, 1949, that a council of Europe was to be created. Invitations to take part in setting it up were extended by the Brussels treaty powers to Denmark, Eire, Italy, Norway, and Sweden, and representatives of these ten countries meeting in London, March 28-May 5, 1949, drew up a statute setting forth the aims and objects of the council of Europe, which was to consist of a committee with executive authority formed by one minister from each participating country, and an advisory consultative assembly of appointed representatives. The council came into existence Aug. 3, and met for the first time at Strasbourg, Aug. 10. Greece, Turkey, and Iceland, invited Aug. 8 by the committee of ministers to join the council, accepted, though Iceland, for constitutional reasons, could not do so in time to be represented at the first meeting. Paul-Henri Spaak, of Belgium, was elected chairman. Sir Gilbert (later Lord) Campion, clerk of the British house of commons 1937-48, was clerk of the assembly. Spaak, in adjourning the meeting on Sept. 9, said, "I came here with the conviction that a united states of Europe is necessary. I leave with the certainty that a united states of Europe is possible."

Recommendations by the assembly that W. Germany and the Saar should be invited to become associate members of the council were endorsed by the committee of ministers, and both sent delegates to the second meeting of the assembly which opened in Strasbourg Aug. 7, 1950, in the newly constructed House of Europe. Perhaps the most important subject on the agenda of this meeting was the so-called Schuman plan (see Schuman, Robert in main text) for the integration of European coal and steel industries and alternative proposals with a similar aim put forward by the British Conservative party.

Added impetus was given to Europe's tendency towards economic integration by the European Recovery Programme (v.i.); but that same programme stressed the differences between E. and W., for Russia refused to take part in the discussions which preceded its inauguration in April, 1948, or to allow any of her satellites to do so, though Poland and, in particular, Czecho-Slovakia, with her then still strong western links, would have liked to be included. Russian hostility to W. European integration, however, hastened rather than delayed the development of the E.R.P.

Full U.S. and Canadian support for W. Europe was given with the signing in Washington of the North Atlantic Treaty (q.v. in N.V.), April 4, 1949.

The merging of the British, American, and French zones of Germany into one, and the subsequent creation in the "trizone," in May, 1949, of the federal republic of Germany (intended to be the major part of an ultimate federal republic of all Germany) had a stabilising effect on the politics and economy of W. Germany, but intensified the division of the country into two, Russia setting up in her zone (a fourth part of the whole country) a "German Democratic Republic," ostensibly of all Germany, in Oct., 1949.

European Recovery Programme. Programme to restore economic stability to post-war Europe with the help of financial aid from the U.S.A. The possibility of such aid, depending on a workable plan of European self-help, first broached tentatively by Dean Acheson, was outlined by George Marshall, U.S. secretary of state, in an unofficial speech at Harvard university on June 5, 1947. It could, he suggested, be part of the general U.S. policy directed against "hunger, poverty, desperation, and chaos." But the initiative, he insisted to a press conference a week later, must come from Europe, through joint action by, preferably, all countries west of Asia, including the U.K. and Russia.

The British foreign minister Ernest Bevin gave an immediate welcome to the "Marshall plan,"

and announced that he was visiting France to discuss with her ways of following up the American proposal. The Benelux countries went to Paris; next day a joint Anglo-French statement proposed a meeting of the French, British, and Russian foreign ministers during the week beginning June 23. Molotov came to Paris, and consultations began on June 27, but broke down on July 2, Molotov refusing to agree to the setting up of a special organization to work out a recovery programme for submission to the U.S.A. on the ground that such an organization would infringe national sovereignties.

The U.K. and France decided to go on without Russian collaboration, and on July 3 issued invitations to 22 European countries (omitting only Germany, from which however the commanders-in-chief of the four zones were invited, Spain, and Russia) to attend a conference in Paris on July 12. Refusals came from Albania, Bulgaria, Czecho-Slovakia (after an earlier acceptance), Finland, Hungary, Poland, Rumania, and Yugoslavia. Representatives of Austria, Belgium, Denmark, Eire, France, Greece, Iceland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Sweden, Switzerland, Turkey, and the U.K., and of the three western occupying powers in Germany, met and set up a committee of economic cooperation. By Sept. this committee had drawn up for submission to the U.S. secretary of state a detailed statement, which it called the European Recovery Programme, showing the assets and needs of the participating countries for the subsequent four years.

Passing of the Foreign Assistance Act

On Dec. 19, 1947, President Truman sent a message to congress recommending the E.R.P. and asking for \$17,000,000,000, to be paid out during April 1, 1948 - June 30, 1952. After exhaustive discussion, congress passed the Foreign Assistance Act on April 2, 1948. It included provision for \$5,300,000,000 (later reduced to \$4,000,000,000 by the Foreign Aid Appropriation Act of June 14) to be spent on European recovery during the first twelve months of the plan. The economic cooperation administration, with Paul G. Hoffman as administrator, was set up to administer Marshall aid.

At a second conference in Paris, March-April, 1948, the Marshall aid countries set up, April 16, a permanent representative body, the organization for European economic cooperation. Bilateral agreements were made between the U.S.A. and each of the 16 cooperating countries, and on Oct. 16 the O.E.E.C. presented to Averell Harriman, the E.C.A.'s special representative in Europe, the recovery plan for the first year of the programme. It envisaged in the participating countries greatly increased production in agriculture and industry,

increased trade among themselves, limitation of imports paid for in dollars to goods necessary to recovery, increase in exports to dollar countries. France, the U.K., and Eire each subsequently published an economic plan covering the four years of prospective Marshall aid.

The U.K. and the Scandinavian countries, France, Italy, and the Benelux countries canvassed possibilities of closer economic association in their respective groups; and general, if somewhat limited, relaxations of exchange and other controls were made between the Marshall aid countries. During the first three months of 1950 European purchases in the U.S.A. dropped by 40 p.c. compared with the same period in 1949, and it seemed possible that by 1952 Europe would be solvent without special U.S. aid, provided there were no unforeseen adverse happenings.

An act providing funds for E.R.P. up to June 30, 1950, was passed by congress Feb. 7, 1949; another providing funds up to June 30, 1951, was passed May 25, 1950, after determined opposition.

Representatives of the W. German Federal Republic were admitted to the O.E.E.C. Oct., 1949.

Purchases authorised by the E.C.A. during April 3, 1948-March 31, 1950, were:

	\$
U.K.	2,391,400,000
France	1,838,800,000
Italy	974,500,000
Western Germany	840,400,000
Netherlands	808,900,000
Belgium	
Luxemburg	472,200,000
Austria	404,900,000
Greece	301,400,000
Denmark	189,100,000
Norway	172,400,000
Eire	117,700,000
Sweden	84,400,000
Turkey	82,500,000
Trieste	23,900,000
Portugal	13,100,000
Iceland	10,900,000

\$5,590,265,000 were spent in the U.S.A.; \$1,084,100,000 in Canada; \$620,700,000 in Latin America; \$386,300,000 in O.E.E.C. countries; \$404,000,000 in other countries.

In Dec., 1950, the trading position of the U.K. had improved to a point at which she was able to suspend acceptance of Marshall aid from Jan. 1, 1951. Total allotment made to her to that date was \$2,694,300,000.

Exchange. While the Bretton Woods agreement provided various controls and aids, including those afforded by the International Monetary Fund, it permitted changes in basic rates under given conditions; and in Sept., 1949, the U.K. reduced the official rate of exchange of the £ sterling to 2·80 U.S. dollars, a devaluation that was followed by many other countries.

Eyre. This lake of S. Australia was filled with water in 1950 for the first time since its discovery

by E. J. Eyre, owing to the fall of unusually heavy rains for several successive years.

Faulkner, WILLIAM. American novelist. He was awarded the 1949 Nobel prize for literature.

Festival of Britain. In April, 1946, a committee set up by the British govt. to consider trade fairs and exhibitions proposed the holding of an international exhibition in 1951 to commemorate the Great Exhibition of 1851. The govt. decided that this was financially impossible; but agreed to a suggestion by Sir S. Cripps that the centenary should be marked by a cultural festival, demonstrating British achievements in science, industry, and the arts. A council was constituted in March, 1948, with Lord Ismay as chairman and Gerald Barry as director-general, to promote the Festival of Britain, to open in May, 1951.

A London site of 27 acres on the South Bank of the Thames was chosen as the chief centre, but the festival was to be celebrated also in industrial cities and ports, and was to incorporate the annual festivals at Edinburgh, Malvern, Stratford-on-Avon, Canterbury, and Bath, the eisteddfodau of Wales, and other annual events in town and country, as well as special festivals at Bournemouth, Liverpool, Norwich, and York. Two travelling exhibitions, one by land, the other by sea, were also planned.

Work on the South Bank site, entailing the demolition of existing buildings and the construction of a new river embankment, began in 1949. One permanent structure was built: the Royal Festival Hall. The largest non-permanent building was the "dome of discovery," an aluminium structure 365 ft. in diam., to house exhibits relating to British exploration. Other temporary buildings were put up to house scientific and industrial exhibits as well as 14 restaurants and cafés. A Bailey footbridge was thrown across the Thames to ease traffic over the permanent bridges. Thirty acres of Battersea Park were converted into pleasure gardens and a fun fair.

Finland. By the peace treaty signed in Paris, Feb. 10, 1947, Finland ceded to the U.S.S.R. the prov. of Petsamo; granted to the U.S.S.R. a 50-year lease of territory to the S.W. of Helsinki for a Russian naval base, together with free communications thereto; had her armed forces restricted to 34,400 army, 4,500 navy (total tonnage 10,000 tons), and 3,000 air force (60 machines, no bombers); and agreed to pay to the U.S.S.R. reparations in kind to the value of \$300 million in 8 years.

In March, 1948, at the suggestion of Stalin, the Finnish govt. agreed, with reservations, to discuss a mutual assistance pact with the U.S.S.R. During the subsequent

negotiations due notice was taken of Finland's view that military assistance from the U.S.S.R. should be given only after talks between the two countries, rather than automatically and that Finnish defence forces should be used only for the protection of Finnish territory. Moreover, Finland insisted on freedom of action in foreign policy. According to Pres. Paasikivi there was no suggestion at any time of dictation in the matter by the U.S.S.R. This pact was ratified at the end of May, and the ratification was followed by a halving of the \$150 million reparations then due to the U.S.S.R.

As a result of elections held in July, 1948, the Agrarian and Social Democratic parties gained in strength at the expense of the Communist-dominated Popular Democratic League. The Social Democrats formed a new minority govt.

Fitzwilliam, EARL. Eric Spencer (b. Dec. 4, 1883) became 9th earl on the death of his first cousin once removed May 13, 1948.

Flag COLOUR PLATE. The new Canadian flag was not adopted.

Flower, SIR (WALTER) NEWMAN. British publisher. His book of reminiscences, *Just As It Happened*, appeared in 1950.

Football. In Oct., 1950, Sunderland paid a record fee of £30,000 for the transfer of Trevor Ford from Aston Villa.

Forbes-Robertson, SIR J. His wife, (May) Gertrude Elliott, died Dec. 24, 1950.

Formosa OR TAIWAN. At the end of 1949, when the Chinese mainland was almost entirely in the hands of the communists, Chiang Kai-shek and his govt. retired to Formosa, and Taipei became the "capital" of the nationalist govt. Following the outbreak of hostilities in Korea (q.v. in N.V.), President Truman declared, June 27, 1950, that the occupation of Formosa by communist forces would be a direct threat to the security of the Pacific area. Under a so-called "policy of neutralisation" the U.S. Seventh Fleet was to prevent any attack on the island, while the Chinese nationalists were to cease air and sea operations against the mainland. The President further stated that "the determination of the future status of Formosa must await the restoration of security in the Pacific, a peace settlement with Japan, or consideration by the United Nations."

Foundling Hospital. In 1951 the Thomas Coram Schools, Berkhamsted (formerly the London Foundling Hospital) became a mixed county modern secondary school for 500 pupils. Of the old pupils 160 remained as boarders; the rest—some 200—were placed with foster parents to attend local primary schools until they reached a suitable age to return to their

old school, the name of which was changed to Ashlyns.

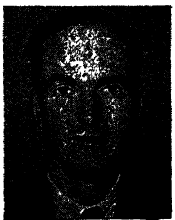
Franc. The centime, 100 of which formerly went to one French franc, was abolished in 1950, and the franc was made the sole unit of currency.

France. Bidault's govt., defeated June 24, 1950, was succeeded by a short-lived ministry under H. Queuille, and then, July 12, by a coalition govt. headed by René Pleven. This continued in office in spite of strong opposition to its demands for funds to finance rearmament for defence made necessary by France's obligations under the North Atlantic Treaty (*q.v.* in N.V.).

Francium. Radio-active element, symbol Fr, at. no. 87, formerly called virginium in America. One isotope, mass no. 224, is in the thorium series; another, mass no. 223 (actinium K) is in the actinium series. Both have a half-life of 21 min.

François-Poncet, ANDRÉ. French diplomat. His book *The Fateful Years: Memoirs of a French Ambassador in Berlin 1931-38*, was pub. in an English trans., 1949.

Franks, SIR OLIVER SHEWELL (b. 1905). British philosopher and diplomatist. Born Feb. 6, 1905, and



educated at Bristol grammar school and Queen's Coll., Oxford, he was fellow and prelector in philosophy at Queen's 1927-37, becoming university lecturer from 1935. In the

latter year he was also visiting professor for three months in Chicago university. From 1937 to 1945 he was professor of moral philosophy at Glasgow university; and in 1946 became provost of Queen's Coll., Oxford. Joining the civil service in the Second Great War, he became permanent sec. of the ministries of Supply and Aircraft Production. He was knighted 1946. In 1947 he headed the British delegation in the Marshall plan talks in Paris, later visiting Washington to discuss the European report with the U.S. govt. and others. In 1948 he was appointed British ambassador to the U.S.A.

Fraser, PETER. This New Zealand statesman died Dec. 12, 1950.

Fry, CHARLES BURGESS. In May, 1950, he resigned from the training-ship *Mercury*, of which he had been honorary resident director since 1908.

Fuchs Case. British espionage trial. Born in 1911 at Rüsselsheim, near Frankfurt-on-Main, Germany, the son of a pacifist clergyman, Karl Emil Julius Fuchs was educated at Leipzig and Kiel universities, and joined the German

Communist party in 1932. In 1933 he came to England as a refugee from Nazi persecution, and continued his scientific studies at Bristol and Edinburgh. After a period of internment, 1940-42, in view of his high reputation as a physicist he was given work in connexion with atomic research. Although he became a naturalised British subject in 1942, he informed the govt. of the U.S.S.R. of the nature of his work. He went to the U.S.A. with a British atomic mission in 1943, and while in that country made several contacts with Russian agents. Returning to Great Britain in 1946, he was sent to Harwell, where he became head of the theoretical division of the atomic energy establishment and maintained contact with Russian agents for some time.

In the autumn of 1949 information reached the British authorities from the U.S.A. that there had been some leakage of information while the British mission had been there. Suspicion was finally narrowed down to Fuchs, who was arrested Feb. 3, 1950, and charged under the Official Secrets Act, 1911, with having communicated information that might be useful to an enemy—namely, atomic secrets. In written and oral statements he admitted that he had been in contact with persons unknown to him who passed on to the Russian government information he himself had supplied. He had accepted reluctantly only one token payment of £100, and his sole explanation of his conduct was that he had had complete confidence in Russian policy and had believed that Russia would build a new world. Since the end of the Second Great War he had revised his opinion of Russian policy and of Communism, and had had misgivings as to the course he had been pursuing. Pleading guilty at his trial, March 1, 1950, he was sentenced to 14 years' imprisonment.

Gaiety Theatre. This was remodelled by Lupino Lane in 1950 for about £180,000, cost of repairs (est. at £100,000) proving prohibitive. The govt. of India proposed to build offices on the site.

Gasperi, ALCIDE DE (b. 1881). Italian statesman. A native of Trent, which he represented in the Austrian parliament, 1919, he became leader of the Italian Christian Democratic party and sat in the Italian parl. until imprisoned, 1926-30, for anti-fascist activities. After the Second Great War, in which he was active in the underground movement, he became minister without portfolio, 1944, then moved to the foreign office. Prime minister from 1946, he formed his seventh administration in Jan., 1950. On a visit to the U.S.A., Jan. 1947, he obtained great economic concessions and successfully enlisted American sympathy and assistance in his struggle with Communism. *See also* Italy in N.V.

Geiger Counter OR **GEIGER-MÜLLER COUNTER.** Instrument for detecting radio-activity and counting atomic particles. A thin wire as anode is surrounded by a metal cylinder as cathode; these are sealed in an airtight enclosure filled with argon (or krypton), at about 5 cm. Hg. The anode is connected through an amplifier to a pulse recorder. A single atomic particle entering the space between wire and cylinder ionises the gas, and the flow of electrons to the cathode produces a pulse. If 1 cm. Hg. of alcohol vapour (or methane) is added, the pulse is rapidly quenched. By varying the H.T. voltage across the electrodes different forms of discharge are obtained and different kinds of particles can be identified. *See* Radio-activity, in main text.

General Medical Council. By the Medical Act, 1950, the council's functions as a disciplinary body were transferred to a medical disciplinary committee, with power to hear evidence on oath and to compel the attendance of witnesses. An appeal lies to the judicial committee of the privy council.

General Service Medal. In 1949 this medal was awarded for the action on the Yang-tse-kiang involving H.M.S. *Amethyst* (*q.v.* in N.V.).

Genetics. At the Soviet Academy of Agricultural Science conference, July-Aug., 1948, a violent attack on Russian scientists who adhered to the Darwinian and Mendelian theory of heredity was launched by Prof. T. D. Lysenko, who claimed to have proved the Lamarckian theory of the inheritance of acquired characteristics by experiments in budding and grafting, and accused his opponents of holding "reactionary" and "bourgeois" ideas. The academy upheld Lysenko's version of I. Y. Michurin's theory, and a number of eminent Russian scientists were removed from their posts by the academy of sciences, which also sent a letter to Stalin apologising for its "mistakes." The "Lysenko controversy" spread to the non-Communist world, where the majority of biologists opposed his beliefs and supported the dismissed Russian professors. *Consult* Soviet Genetics and World Science, J. Huxley, 1949.

Geneva. Canton of Switzerland. Pop. (1950) 197,265.

Geneva Convention. Four International Red Cross conventions were adopted at Geneva, Aug. 12, 1949. One of these, concerned with protection of civilians in war-time, was entirely new and marked a fresh step in international law. This called for the designation in peace-time of "security zones" for wounded, children, mothers, and aged persons; during actual fighting there should be "neutral zones" for sick and wounded as well as for

non-combatants; rules were laid down for the treatment of the inhabitants of occupied countries. The other three conventions, concerned with treatment of prisoners of war, care of wounded soldiers and sailors, and maritime warfare, were amendments of existing conventions. Although few representatives signed for their govts. without some reservation, the total number of signatories on the protection of civilians was 60, and on the remaining three conventions, 61.

Geoy Tepe. Locality of N. Persia near L. Urmia. A series of objects varying from the Al Ubaid period to the 2nd millennium B.C., excavated here, was presented to the Ashmolean Museum, Oxford, in 1949. This was the first collection of objects ever made in this region by extensive scientific excavation.

Germany. The division of the country into two—a large western part under the control of the three western powers, the U.K., the U.S.A., and France, and a much smaller eastern part under Russian control—became more marked after 1946.

The coordination of W. Germany began with the setting up of a German bizonal economic council at Frankfurt-on-Main by the British and U.S. occupation authorities in June, 1947. The powers of this council were extended by a new charter in Feb., 1948; and from Nov. 1 it took over the trade of the French-administered *Länder*. At its head was Hermann Pünder, once secretary of state of the Reich chancellery. Its first concern was the improvement of the bad food conditions prevailing as a result of a severe winter 1946-47, currency disorder and inflation, the black market, and the stream of refugees and expelled persons from the E.; but it and the *Länder* govts. also strove successfully for a general increase in industrial and agricultural production.

Drastic currency reform, strictly controlled in the west and more or less sham in the east, was imposed from June 21, 1948. More than 90 p.c. of the Reichsmarks in circulation were cancelled, and a new *deutsche Mark* was created. Thereafter consumer goods reappeared and industrial production rose rapidly from about 40 p.c. of the 1936 level to 78 p.c. by the end of 1948, 99 p.c. by mid-1950. Building, necessitated by the heavy destruction of the war and the increased population, was an important item in this development. The participation of W. Germany and W. Berlin in the European Recovery Programme (*q.v.* in N.V.) was a main factor in recovery.

Steady, though at first slow, progress towards the unification and economic reintegration of the three western zones culminated with the drafting of a new constitution for a federal republic of Germany by a provisional assembly

meeting at Bonn. This constitution was approved by the tripartite military govt. in the west, May 12, 1949, and the republic was proclaimed May 23. Federal elections for the lower house (Bundestag), held Aug. 14, gave the Christian Democratic Union 139 seats, the Social Democratic party 131, the (Liberal) Free Democratic party 52, the Bavarian party (regionalists) 17, the German party (right wing) 17, and the Communists 15. The C.D.U., F.D.P., and German party formed a coalition, and on Sept. 12 Theodor Heuss, leader of the F.D.P., was elected president. On Sept. 15 Konrad Adenauer, leader of the C.D.U., was elected chancellor, and formed a cabinet of 14 with nine C.D.U. members, three F.D.P., and two German party. Kurt Schumacher, leader of the Socialists and unsuccessful candidate for the presidency, led the opposition.

The federal govt. had limited powers, the govts. of the *Länder* retaining considerable autonomy in *e.g.* finance, taxation, education, police. A federal council (Bundesrat), composed of representatives of the *Länder* appointed by their govts., served as an upper house. Bonn was selected as capital of the new republic. Allied military govt. ended Sept. 21, and was replaced by a civilian Allied high commission. In 1950, W. Germany was allowed to resume limited diplomatic relations abroad. Proposals made later in the year by the U.S.A. that Germany should be asked to provide troops for integration into a W. European army were not welcomed by Adenauer, who in this had the support of a large number of his fellow countrymen.

Meanwhile, the conflict within the Allied control council had culminated in a desertion of the council by the Russians, March 20, 1948. Henceforth they administered their zone without consultation with their Allies, and the area assumed increasingly the pattern of other Soviet satellite countries. The Socialist Unity party—a combination of a Communist minority and a much more numerous Socialist party brought about in 1946—came to power. A "people's council" meeting in E. Berlin adopted May 30, 1949, a draft constitution, and on Oct. 7, 1949, a "German Democratic republic" was proclaimed in E. Berlin. The "people's council" declared itself a "provisional people's chamber," and elected the Communist Wilhelm Pieck as president, the Socialist Unity party leader Otto Grotewohl as premier, and Walther Ulbricht, Moscow-trained Communist leader, as vice-premier. Ulbricht, backed by a heavily armed "people's police," soon assumed virtually dictatorial powers. The E. German govt. signed an agreement with Poland July 6, 1950, confirmed Nov. 28, accepting the Oder-Neisse line as the E. German frontier.

Chiefly as a result of a continuing stream of refugees from the E., unemployment in W. Germany rose to more than two million during the winter of 1949-50, falling to 1.4 million by July 1, 1950, by which time German exports had increased from the 1948 average of 150 million deutsche marks to 550 million. *See also* in *main text* Air Lift; Saar Basin.

Gezira. Region of Anglo-Egyptian Sudan. After June 30, 1950, the Gezira irrigation scheme was administered by a board responsible to the govt.

Giauque, WILLIAM FRANCIS (b. 1895). American chemist. Born at Niagara Falls, Ont., Canada, May 12 1895, and educated at California university, he was appointed instructor in chemistry there, 1927, professor, 1934. Awarded the Chandler medal of Columbia university, 1936, for the invention and first application of the adiabatic demagnetization method of producing temperatures below 1° absolute, he was awarded the Elliott Cresson medal of the Franklin institute the following year. With H. L. Johnson, he discovered oxygen isotopes 17 and 18 by means of the absorption of sunlight in the earth's atmosphere. He was awarded the Nobel prize for chemistry, 1949, for studies in the behaviour of matter in temperatures close to absolute zero.

Gide, A. P. G. This French writer died in Paris, Feb. 19, 1951.

Gironde. Dept. of France. The worst of the fires which devastated 399,000 acres of the forests of the Landes in Aug., 1949, occurred in the Gironde dept., where 84 firefighters were killed.

Giuliano, SALVATORE (1923-50). Sicilian bandit. Born at Montelepre near Palermo in 1923, he was in 1943 a clerk in Palermo, and also a black market dealer in rationed foods. Caught carrying a sack of flour by carabinieri, he shot one of them dead, and escaped, an outlaw. Round him he gathered a band of other lawless men, among whom and in the countryside he posed as a champion of the liberation of Sicily. By 1950, he and his band had killed some 150 persons, including 102 policemen, and wounded many more. Put on trial at Viterbo in his absence, he was charged with 105 murders and more than 200 crimes of kidnapping, extortion, and blackmail.

In 1949, a new commander of the local carabinieri, Colonel Luca from Piedmont, was appointed. He replaced the Sicilians in his force by men from north Italy, then succeeded in persuading Giuliano's lesser followers to return to lawful life, captured 25 of the more important, and eventually surprised Giuliano and five companions in a house at Castelvetrano, some 30 m. from Montelepre, his usual centre of operations. Giuliano was shot dead July 5, 1950, in trying to make his escape.

Glyndebourne. There were no opera seasons here during 1947-49, but the theatre was reopened in 1950, when the first post-war Mozart festival was given.

Goddard, RAYNER GODDARD, BARON (b. 1877). British judge. Educated at Marlborough and at



Trinity Coll., Oxford, he became a K.C. in 1923. He was recorder of Poole from 1917 to 1925, then of Bath until 1928, then of Plymouth until 1932, when he was appointed

a high court judge in the king's bench div. In 1938 he was made lord justice of appeal and in 1944 a lord of appeal in ordinary, becoming lord chief justice of England in 1946. In 1948, when proposals for the experimental suspension of capital punishment for five years, having passed the house of commons, were being discussed by the lords, Goddard advanced forcible arguments for its retention, and his speech had probably a direct effect on the final vote which rejected the proposals.

Gold. The transmutation of mercury into gold was accomplished in 1949. See *Alchemy*, in N.V.

Gold Coast. After the end of the Second Great War increasing efforts were made to give the Africans of the Gold Coast a greater share in the government of the colony. A constitution, inaugurated March, 1946, set up a new legislative council, which was the first legislature of a tropical African colony to have an elected African majority.

But serious riots broke out in Accra, Feb.-March, 1948, involving loss of life, and these had to be quelled by force. A commission of inquiry reported *inter alia* widespread dissatisfaction with the 1946 constitution because it left so much power in the hands of the chiefs "whose star was on the wane." Educated Africans could see no prospect of political power under the new constitution.

A new committee on constitutional reform, consisting entirely of Africans under the chairmanship of Judge Coussey, was set up in Jan., 1949. Its report, published in the following Oct., dealt with local and regional administration as well as central govt., and laid stress on keeping and bringing up to date the institution of the chieftaincy. Most of its recommendations were accepted by the British govt. The franchise was extended in Dec. to men and women over 21 with a residence qualification, on payment of an annual tax of 4s. A new constitution proclaimed Dec. 30, 1950, provided for a central legislature of 84 (75 Africans, 9 Europeans), and a cabinet responsible to it of 11 (8 Africans, 3 Europeans).

Elections held in Feb., 1951, for which some 40 p.c. of eligible persons had registered, gave 34 seats to the Convention People's party, which aimed at independence within the Commonwealth in the shortest possible time, and had support from some dozen other members.

Goodwood. The war-time Goodwood airfield (adjoining the horse-race track) was made into a motor racing track by the duke of Richmond. Racing began 1948.

Gottwald, KLEMENT (b. 1896). Czecho-Slovak president. Born an Austrian at Desice, S. Moravia,



Nov. 23, 1896, he worked first as a joiner. He served in the First Great War, joined the Communist party, 1922, and became its sec-gen., 1929. During the German occupation he

escaped to Moscow, returning in 1945 to become vice-premier in Fierlinger's govt. When in the 1946 election the left-wing bloc secured a majority, Gottwald became premier of a left-wing coalition govt.

He opposed the Marshall plan, and enforced the nationalisation of all enterprises with more than 50 employees, and of the agrarian estates. After the Communist coup of Feb., 1948 (see Czecho-Slovakia, in N.V.), a new constitution was drawn up under Communist pressure, and elections in May on joint electoral lists eliminated the opposition. Benes's reluctance to sign the new constitution led him to resign, and the new assembly unanimously chose Gottwald to succeed Benes as president.

The town of Zlin in Czecho-Slovakia was renamed Gottwaldov in 1948.

Gould, SIR FRANCIS CARUTHERS. His eldest son Alec, mentioned in the same entry, died Sept. 5, 1948.

Graziani, RODOLFO. Italian soldier. On May 1, 1950, he was sentenced in Rome to 19 years' imprisonment for collaboration with the Germans. Reduction of the sentence by the time already spent in custody and under various amnesties led to his release Aug. 28, 1950.

Greece. From mid-1946, the conflict between the govt. (right wing and moderate) and the Communist E.A.M. (Ethnikon Apeleutherikon Metapon, national liberation front) developed into open war, fostered by assistance to the rebels from Greece's Russian satellite neighbours Albania, Yugoslavia, and Bulgaria. Greece brought a complaint against these neighbours before the U.N. security council in Dec., and a U.N. per-

manent commission, appointed in Oct., 1947, to watch the situation in the Balkans, confirmed the truth of the Greek charges.

In Aug., 1947, "General Markos" (Markos Vafiades), leader of the rebels, proclaimed Greece a republic with himself at its head; in Dec. he announced the setting up of a "provisional govt." The rebel forces, when forced to withdraw, took with them children and other civilians from the towns and villages they had captured and abandoned; these children, estimated to number 28,000, were dispersed among the Soviet satellite countries, and all efforts by the U.N. to secure their return to Greece proved vain. The Greek economy meanwhile continued to deteriorate.

Yugoslav support of the rebels grew steadily less active after Yugoslavia's expulsion from the Cominform in July, 1948. During July and Aug. the Greek army successfully attacked in the Grammos mts., bordering Albania; another successful campaign in the Vitsi mts. in W. Macedonia followed. Isolated guerilla attacks in Thessaly and the Peloponnese were also countered. Fighting died down in Oct., but was active again during the winter. More than 4,000 rebels, attacking Florina (W. Macedonia) in Feb., 1949, were decisively beaten and driven off. The Peloponnese was cleared by March. April brought renewed attacks from Albania in the Grammos mts.; the rebels were defeated with heavy losses. In a battle fought in the Vitsi area on Aug. 16, 1949, 1,931 rebels were killed or captured, the remainder, some 5,000, leaving behind supplies and equipment when they escaped to Albania or Yugoslavia. By the end of Aug. govt. troops were in control of the Grammos area, and the civil war appeared to be at an end. During June, 1946-March, 1949, rebel losses were estimated at 70,000 killed, surrendered, or captured; govt. losses were 37,934 killed, wounded, or missing. Martial law was lifted in the south of Greece on Dec. 24, 1949, elsewhere on Feb. 8, 1950. The last British troops, some 600, left Greece on Feb. 5, 1950. See also *European Recovery Programme* in N.V.

Greenwich Observatory. The solar and chronometer depts. and the nautical almanac office were installed at Hurstmonceux by 1950; the move was to be completed in 1953.

Greenwood, ARTHUR. British politician. He resigned office in Sept., 1947.

Ground Nut Scheme. Scheme launched in 1946 by the British govt. In May, 1946, the U.N. food and agriculture organization recommended that, to help meet a shortage of oils and fats, more oil-seed crops should be grown. Later that year the United Africa Co. (a

subsidiary of Unilever, one of the largest companies in the world making margarine and soaps) suggested to the British govt. that large-scale production of ground nuts would be possible in British East Africa.

A mission headed by A. J. Wakefield, formerly director of agriculture in Tanganyika, was sent to E. Africa by the secretary for the colonies, and reported very favourably on the suitability of certain districts in Kenya, Tanganyika, and N. Rhodesia for large-scale, mechanised production of ground nuts. The govt.'s intention to embark on the scheme was announced by John Strachey, minister of food, Nov. 25, 1946, and the United Africa Co. was appointed agent to manage its initial stage.

A white paper issued Feb. 5, 1947, recommended a five-year development plan for 107 areas of 30,000 acres each—80 in Tanganyika, 17 in N. Rhodesia, 10 in Kenya. It was est. that by 1950-51 the ground nut harvest would be 600,000 tons—enough to supply about a third of the additional fats required by the U.K. to meet all her needs. The cost over six years was est. at £24,000,000, including £4,750,000 for agricultural machinery, £1,250,000 for a new rly. and port. Cost of ground nuts was expected to be just over £14 a ton (compared with the then current market price of £32).

Work began in Tanganyika at the beginning of Feb., 1947. Plans for a new deep water port, Mtwara, in S. Tanganyika on Mikindani bay, and a rly. connecting it with a development area around Nachingwea, at a cost of £4,000,000, were accepted by the British govt. in April, 1947. During 1947, 7,000 acres in all were cleared and planted. On March 1, 1948, the overseas food corporation, set up by the Overseas Resources Development Act, Feb. 10, 1948, and responsible to the ministry of food, took over the management of the E. Africa ground nuts scheme.

The corporation's first annual report, issued Nov. 1, 1948, covered the period March 1, 1948, to March 31, 1949. Liabilities incurred amounted already to £23,200,000 (including £9,000,000 by the U.A. Co. during its 16 months of management). There had been development in three areas—Kongwa, Urambo, Nachingwea. Conditions at Kongwa had proved adverse—rainfall was low (about 20 ins. a year) and unreliable, the bush was difficult to clear (the machinery used, designed for American conditions, was not robust enough for African), and the soil was highly abrasive. Rainfall at Urambo was rather better, and the soil appeared to be more fertile. Development at Nachingwea had been on a small, experimental scale only. Cost of clearing the bush had been nearly £40 an acre (instead of an est. £3 17s. 4d.). At Kongwa, 25,105

acres were planted with ground nuts, 19,429 acres with sunflower (a "breaking in" and rotation crop), 1,733 acres with maize; at Urambo, 487 acres with ground nuts, 2,052 acres with sunflower, 250 acres with maize. Severe drought limited the crop for 1947-48 to 2,150 tons of unshelled ground nuts (528 lb. of unshelled nuts per acre instead of an est. 850 lb. of shelled nuts), 800 tons of sunflower seed.

The year 1949 was again excessively dry. On Nov. 19 the minister of food announced that Wakefield and J. N. Rosa, another member of the mission which had reported favourably on the scheme at its inception, had been dismissed from membership of the overseas food corporation; the chairman, Sir Leslie Plummer, resigned in June, 1950.

During 1949-50, 83,000 acres of a total of 90,000 acres cleared, were planted. Harvests gathered up to the end of June, 1950, were: Kongwa 320 lb. of unshelled nuts per acre, from 3,100 acres, 90 lb. of sunflower seed an acre from 32,100 acres, 700 lb. of maize per acre from 1,900 acres, 780 lb. of sorghum per acre from 520 acres; Urambo, 810 lb. of unshelled nuts an acre from 2,700 acres, 140 lb. of sunflower seed per acre from 7,950 acres, 700 lb. of maize an acre from 870 acres; Nachingwea, 800 lb. of unshelled nuts per acre from 250 acres; 400 lb. of sunflower seed per acre from 150 acres. Total tonnage: 1,500 tons of unshelled ground nuts, 1,800 tons of sunflower seed, 850 tons of maize, 180 tons of sorghum. Development continued, but as part of govt. long-term plans for developing backward areas rather than with any idea of increasing rapidly the world's supply of edible oils. Legislation to transfer direction of the new plans to the colonial office, and to write off £36,500,000 spent by the overseas food corporation on the original scheme to the end of March, 1951, proposed in a white paper (Cmd. 8125), Jan. 9, 1951, was introduced a month later. See Tanganyika map in main text.

Guadeloupe. This, with its dependencies, became a department of France, Jan. 1, 1947.

Guided Missile. Self-propelled explosive missile guided to its target by means of a gyroscopic or radio-controlling unit. Such weapons were introduced by the Germans in the Second Great War, the most notable being the flying bomb, the rocket bomb, and the glider bomb. Neither the flying nor the rocket bomb was an accurate weapon; glider bombs could be launched and guided only from aircraft flying at a comparatively low altitude.

After the Second Great War, theoretical and practical investigation made by the U.S.A. and others showed that a guided rocket could be made to strike only within

15 m. of the point aimed at from a range of 200 m.; at a range of 2,000 miles, the error might be between 150 and 200 m. Moreover, enemy jamming of the wavelength of the radio frequencies guiding the missile to its target could throw it still farther off course. Work was therefore concentrated on developing short-range, radio-controlled missiles for use against raiding bombers.

The most efficient of these, operated on the ram-jet principle, could be either shot out of a gun on the ground or in defending aircraft, or driven by rockets. Once the ram-jet came into operation the missile travelled at bullet speed and had an effective range of 30 m. The nose of the missile had a radio proximity fuse which detonated the explosive charge when it came within destructive range of the target.

The British A.A. Fairey guided missile could be accurately radio-controlled on to a target up to 4 m. distant. The U.S. Bat, with a radar nose, had a similar range; it was first tested at Wendover, Utah, in 1947.

Another type of guided missile, the homing torpedo, consisted of an ordinary torpedo with, in its nose, an acoustic device which, picking up the echo from a ship, actuated the torpedo's steering mechanism and guided it to the target; it exploded on impact. Short-range guided rockets fitted with radio-proximity fuses were developed for saturation bombardment of armour in land warfare. See Rocket Propulsion and Weapons (main text).

Gustavus V. King of Sweden. He died at Drottningholm Palace, Stockholm, Oct. 29, 1950, and his elder son (b.1882) succeeded as Gustavus VI.

Gwynn, STEPHEN LUCIUS. Irish author. He died in Dublin, June 11, 1950.

Gwynne, HOWELL ARTHUR. British journalist. He died June 26, 1950.

Haifa. The Arab-Jewish tension following the setting up of the state of Israel (q.v. in N.V.) led to a suspension of the transmission of oil through the pipe line from Iraq and by tanker through the Suez Canal. The Haifa refinery, after being closed for two years, was reopened Aug. 28, 1950, to refine oil from the western hemisphere.

Hailsham, DOUGLAS MCGAREL Hogg, 1st Viscount. He died at his home at Hailsham, Sussex, Aug. 16, 1950, and was succeeded by his son Quintin Hogg, M.P. for Oxford 1938-50.

Ham (Surrey). Ham House, with its collection of 17th cent. furniture, was opened to the public in 1950; it had been given to the National Trust in 1948 and leased to the ministry of works, the contents being under the super-

vision of the Victoria and Albert museum.

Hamburg. The first census after the war, October 29, 1946, showed a pop. figure of 1,406,158. Statistics of July, 1947, gave 42 p.c. of all Hamburg's buildings as destroyed or severely damaged; the remaining number of dwellings, mostly flats, as 286,000, representing 53 p.c. of the pre-war number. Yet the pop. at the end of 1948 was est. at nearly 2,000,000, as in 1939. Plans to increase the capacity of the port to handle cargoes from 9,600,000 tons a year to 15,000,000 tons (pre-war figure was 26,000,000 tons) were announced in 1950.

Hamilton, (A. W.) PATRICK. British dramatist. His Autobiography was pub. 1948.

Hammer, THROWING THE. A world's record throw of 195 ft. 5½ in. was made by I. Nemeth (Hungary), 1949.

Harbin. With the rest of Manchuria, Harbin was again in Communist control by the end of 1948.

Harmer, SIR SIDNEY FREDERIC. This British scientist died Oct. 22, 1950.

Harriman, WILLIAM AVERELL. American diplomat. In 1950 President Truman appointed Harriman his special assistant on foreign policy.

Harwood, SIR HENRY. British sailor. He died June 9, 1950.

Hawaii. A bill to grant statehood to Hawaii was passed by the U.S. house of representatives in March, 1950.

Health, MINISTRY OF. Responsibility for housing was transferred to the ministry of local govt. and planning (formerly town and country planning) Jan., 1951.

Health Service. See National Health Service in N.V.

Heart, DISEASES OF. During 1948-49 six out of nine selected cases of mitral stenosis were successfully treated at Guy's hospital, London, by valvulotomy, an operation within the heart.

Helpmann, ROBERT. Australian dancer, choreographer, and actor. During the 1948 festival at Stratford-on-Avon he played Shylock, King John, and Hamlet. He was choreographer and premier danseur of the film *The Red Shoes* (1948). In 1949 and 1950 he visited the U.S.A. and Canada with the Sadler's Wells ballet, of which he ceased to be a regular member Nov., 1950.

Hess, WALTER RUDOLF (b. 1881). Swiss physiologist. Born at Frauenfeld, Switzerland, March 17, 1881, and educated in Switzerland and Germany, he specialised in diseases of the eye and brain, and from 1917 was director of the physiological institute of Zürich university. President of the international congress of physiology in

1938, he was in 1949 joint winner, with A. E. Moniz, of the Nobel prize for physiology and medicine.

Heuss, THEODOR (b. 1884). First president of the federal republic of W. Germany. Born at Brackenheim, Württemberg, Jan. 31, 1884, he studied in Munich and Strassbourg, becoming a disciple of the reformer Naumann, who entrusted Heuss with the



editorship of *Die Hilfe*, 1905. In 1912 he took over the Heilbronn daily *Neckarzeitung*. After the First Great War he sat in the Reichstag as a democrat, and became director and lecturer at Berlin political academy. A scathing analysis of the Nazi ideology, *Hitler's Way*, 1932, provoked the immediate dismissal of Heuss when Hitler took power. In retirement he wrote biographies of Naumann (1937) and Liebig. Occupying troops in 1945 found Heuss in a Heidelberg attic and made him Württemberg's minister of education. The next year he became professor of history and politics at Stuttgart technical university and Liberal leader in the regional diet. At the Bonn assembly he took a decisive part in creating the federal constitution; and was elected president of the new federal Germany, Sept. 12, 1949, by the federal convention (composed of the 402 members of the *Bundestag* and 402 members from the *Länder*) by 416 votes out of 760. *Pron. Hoyes.*

Hichens, ROBERT S. British novelist. He died at Zürich, July 20, 1950.

Himachal Union. Pop. (1950 est.) 1,080,000.

Hiroshima. This Japanese city, consisting by the end of 1950 of shoddy, dirty, one-storey wooden huts, had by then become a busy centre of tourists seeking atomic bomb souvenirs.

Hiss Case. Perjury trial in the U.S.A. It arose out of evidence given by Whittaker Chambers, an ex-Communist, before the U.S. house of representatives committee on un-American activities. On Aug. 3, 1948, he stated that, when he was a member of the Communist party, 1924-38, among a Communist underground group in Washington with whom he kept in touch was Alger Hiss, one of Franklin Roosevelt's New Deal young men, who in 1936 entered the state dept., was one of the advisers accompanying Roosevelt to Yalta, was sec.-gen. of the U.S. delegation to the San Francisco conference, and in 1948-49 was director of the Carnegie endowment for international peace.

Giving evidence next day, Hiss swore that he had never been a Communist, and denied all know-

ledge of Chambers. On Aug. 25, however, brought face to face with him in a New York hotel, Hiss recognized him as "George Crossley," a free-lance journalist he had met some dozen times during 1934-36. In a broadcast Chambers repeated his accusations and, at the urgent persuasion of his friends, Hiss started an action for slander, claiming 75,000 dollars damages.

Hiss's lawyers asked Chambers if he had any documentary proof of his assertions. He produced, Nov. 17, a number of typewritten documents which, he said, came from the state dept. and had been given to him by Hiss. The house committee on un-American activities thereupon subpoenaed Chambers, directing him to produce these and any other material he might have, and on Dec. 2 he handed in five micro-films containing 200 photographs of what purported to be govt. documents. These, he said, he had kept in a hollowed-out pumpkin at his Maryland farm. The documents bore dates during Jan.-April, 1938, and some were said to be in Hiss's handwriting.

On Dec. 6, before a federal grand jury investigating alleged Communist spying, Chambers declared that during 1934-38 he had regularly collected confidential documents from Hiss and other unconfessed Communists in the state dept., had had micro-films made of them, returned the documents, and passed the films to Col. Bykov, a Russian agent. Hiss and his wife were called to give evidence before the grand jury, which ordered his arrest, Dec. 15, on a charge of perjury. (Under the U.S. Statute of Limitations, he could not be charged with espionage since the charges related to acts alleged to have been committed more than three years earlier.)

The case came on before the New York federal district court on May 31, 1949, and continued until July 8, when the jury, after 29 hours' deliberation, announced that they could not agree; eight were for conviction, four for acquittal. The judge discharged them, and ordered a retrial. The second trial began on Nov. 17, and continued until Jan. 21, 1950, when the jury, after 24 hours' consideration, returned a verdict of guilty. Hiss was condemned to five years' imprisonment and, pending an appeal, released on 10,000 dollars bail. He was disbarred as an attorney in New York state, May 2.

The U.S. circuit court of appeal confirmed Hiss's conviction, Dec. 7, 1950; and rejected his appeal for a rehearing Jan. 4, 1951. On Jan. 27 he appealed to the supreme court, on the grounds that the circuit court had made four errors.

No jury would have believed Chambers unsupported by other evidence—he confessed in court to being a liar, a former Communist spy, and a perjurer; but Hiss's

lawyers were not able to produce a convincing explanation of certain of the documents, some typed on a typewriter that had at one time belonged to Hiss, others allegedly in Hiss's own handwriting.

Consult A Generation on Trial: U.S.A. v. Alger Hiss, A. Cooke, 1950; Seeds of Treason, R. de Toledano & V. Lasky, 1950.

Hittites. At Karatepe in the foothills of the Taurus Mts. in Turkey, near the Jeyhan river, archaeological excavations brought to light in 1947 walls covered with bilingual inscriptions (Phoenician and Hittite), believed to be identical in sense. It was hoped that from these experts would at last be able to decipher Hittite hieroglyphs and thereby greatly increase knowledge of the history of Asia Minor in the period from the 15th to the 8th century B.C.

Hogg, Quintin. British philanthropist. His grandson, also Quintin Hogg, mentioned in the same entry, succeeded his father as the 2nd Viscount Hailsham in 1950.

Holy Island. Govt. approval to proposals to establish an anti-tank gun range some 2½ m. from Holy Island was given in 1948, in spite of opposition by the bishop of Newcastle and others.

Hong Kong. Pop. (est. 1950) 2,250,000.

Hoover Dam. This, the original name of the great dam across the Colorado river, U.S.A., also called Boulder Dam (*q.v.* in main text), was officially restored in 1947.

Hungary. A general election in Aug., 1947, produced a national assembly of 100 Communists (27·5 p.c. of the seats, with but 22 p.c. of the votes), 68 Smallholders, 67 Social Democrats, 38 National Peasants, who formed a govt. bloc of 271 against an opposition of 60 Popular Democrats, 49 Hungarian Independents, 18 Independent Democrats, and 13 others. Lajos Dinnyes, chosen prime minister after Nagy's self-imposed exile, re-formed his cabinet to include as vice-premiers the Communist Matyas Rakosi and the Social Democrat Arpad Szakasits. Many ex-ministers were imprisoned; others fled the country, and several Hungarian diplomats left the service and took refuge abroad.

The Allied control commission withdrew in Sept., 1947, but certain Russian forces remained "to safeguard communications." In Feb., 1948, a Hungarian delegation headed by the president, Zoltan Tildy, visited Moscow, Dinnyes signing a twenty-year pact of friendship and alliance with Russia on the 18th. Subsequently Hungary fell into line with Kremlin policy, e.g. in closing the Danube to the west, in refusing Marshall aid, and in supporting the Cominform and ostracising Marshal Tito. In home politics, the Socialist party was split, its left wing merg-

ing with the Communists in June, 1948, to form the Workers' party. The Smallholders were also split between members ready to cooperate completely with the Communists, and others who objected to subservience to Moscow. Gradually the whole economic system came under state ownership or state direction. From Feb., 1948, all business enterprises employing more than 100 were nationalised, from Dec., 1949, all those employing more than ten. These measures were carried out by decree without reference to the national assembly.

Tildy was made to resign the presidency, July 30, 1948, following the arrest of his son-in-law for alleged acts of treason. He was succeeded by Szakasits, who had been a chief mover in the merging of his party with the Communists. Dinnyes resigned the premiership, Dec. 9, and was followed by another Smallholder, Istvan Dobi.

The R.C. church had always had great political power in Hungary, for the king had been accustomed to consult the primate on all important occasions; the church also possessed the traditional loyalty of the peasantry. One of the aims of the republic was to reduce its power. Under the land reform of 1945, the church, formerly the largest single land-owner in Hungary with 1,128,000 acres, lost more than a million acres. A law of June 16, 1948, nationalised and secularised all schools. The Protestant denominations accepted terms from the govt., and secured the return of their secondary schools; the R.C. church would not negotiate unless its property were returned. Numerous clergy were arrested in Dec., 1948, on charges of espionage, conspiring with foreign enemies, etc.; and a world sensation was caused by the arrest of the primate himself, Cardinal Mindszenty, on Dec. 27. At his trial, Feb. 3-8, 1949, he was found guilty, on his own "confession," of treason, espionage, and currency offences, and was condemned to life imprisonment.

Elections held on a single list, May 15, 1949, produced a completely subservient national assembly which adopted, Aug. 18, a new constitution based on that of Russia. The office of president of the republic was abolished, Szakasits becoming chairman of the presidium. Vice-premier Rakosi, secretary general of the Workers' party, became virtual dictator of Hungary. Purges that followed inside the Workers' party suggested its unity was not complete, and the increasing tension between Tito and the Cominform led to accusations of Titoism against suspected dissidents. The Communist minister of the interior, Laszlo Rajk, was executed Oct. 15, after a sensational trial with seven others; all eight confessed to the charges made against them of spying and conspiracy. Similar trials followed, as

well as trials of alleged saboteurs, most of whom were accused of opposing the collectivisation of agriculture that followed the post-war breaking up of large estates. In May, 1950, Szakasits was made to resign, and was replaced by another former Social Democrat, Sandor Ronai.

Besides her treaty with Russia, Hungary made treaties of mutual assistance during 1948 with Rumania and Bulgaria. She entered into trade agreements with Czechoslovakia, 1945, Poland and Sweden, 1946, Austria and Russia, 1947, and the U.K., 1948. Her relations with the west deteriorated, however, and negotiations for a renewal of the trade agreement with the U.K. were suspended in Dec., 1949, in consequence of the arrest of Edgar Sanders, a British subject, on charges of spying. With Robert A. Vogeler, a U.S. citizen, and Imre Geiger, a Hungarian, all three employees of an American co. operating in Hungary, he was brought to trial Feb. 17, 1950. All three made the customary plea of guilty; Sanders was condemned to 13 years' Vogeler to 15 years' imprisonment; Geiger was condemned to death, and executed May 10. No member of the British or American diplomatic service was allowed to establish contact with Sanders or Vogeler before, during, or after trial.

Hyderabad. State of India. Pop. (1950 est.) 17,690,000.

Hydroponics. The system of growing plants with their roots continuously immersed in a liquid culture medium was first developed by N. F. Gericke in California. It has not proved equally successful in Great Britain, or even in the eastern states of the U.S. This is believed to be chiefly due to the much lower intensity of sunlight available. Two other systems of soilless culture have been tried out in England, with considerable success. In one the plants are grown in sand and the nutrient solution is supplied by surface watering or automatic drip-feed. In sub-irrigation culture, the plants are grown in gravel or crushed clinker in waterproof tanks, into which the nutrient solution is pumped from time to time and then allowed to run off. Tomatoes, carnations, orchids, and other high-value crops have been produced commercially by sand culture, and the sub-irrigation system is used by the R.A.F. to provide fresh vegetables at desert stations.

Illinium. The name of this chemical element was officially changed in 1949 to promethium.

Illustrated London News. The Bruce Ingram received a knighthood in 1950, the year in which he celebrated his fiftieth year as editor.

India. The pop. of the republic was estimated in 1950 to be 347,340,000.

Indonesia. The federal govt. of the U.S.I. and the govt. of the republic of Indonesia signed in Jakarta an agreement providing for the formation of a unitary (instead of a federal) state, May 19, 1950. The new state, with ten provs., was proclaimed on Aug. 15.

Ingram, REX. Irish-American film director. He died July 21, 1950.

Inman, PHILIP ALBERT INMAN, BARON. This British administrator resigned the chairmanship of the hotels executive of British Rlys. Jan., 1951.

Inönü, ISMET. Turkish statesman. His People's party, which had been in power in Turkey continuously since 1923, was heavily defeated in the general election of May, 1950, by the Democratic party. Inönü himself was defeated at Ankara but returned at Malatya, and led the opposition in the new parliament. He was succeeded as president of Turkey by Celal Bayar (q.v. in N.V.).

International Trade Organization. Body first proposed by the Economic and Social Council of the U.N. in 1948, with the object of expanding world trade by removing trade barriers. A preparatory committee was appointed, and early in 1947 a drafting sub-committee met in New York to draw up a world trade charter. The preparatory committee discussed its proposals in Geneva and London, and the charter was signed at Havana, March 28, 1948, by 53 states, but ratification was delayed owing to increasing international tension. Tariff negotiations were conducted from time to time. But at the beginning of 1951 both the U.S.A. and the U.K. decided not to ratify the charter.

Iran. In 1949 the name Persia was officially resumed by the Iranian govt. in dealing with foreign countries.

Irian. Name given by Indonesia to New Guinea.

Isaacs, G. A. This British politician became minister of pensions Jan., 1951.

Israel. Independent republic of Western Asia. It came into existence at 4 p.m. on May 14, 1948, eight hours before the expiry of the British mandate for Palestine, when David Ben-Gurion (q.v. in N.V.), in a broadcast from Tel Aviv, proclaimed an independent Jewish state, Israel, with himself as prime minister and minister of defence. The first act of his provisional govt. was to declare the state open to all Jews. Chaim Weizmann, a former president of the world Zionist organization, accepted an invitation to be provisional president. *De facto* recognition was accorded to Israel by the U.S.A. on the same day, by Russia on May 17. The U.K. did not recognize the new state (whose boundaries were still unsettled)

until Jan. 30, 1949. By the end of 1950 Israel had also been recognized *de facto* by all countries of the British Commonwealth except Pakistan and Ceylon; by all the countries of Europe except Spain, Portugal, and Greece; by most countries of Central and S. America; and by Persia. She was accepted as a member of the U.N., May 11, 1949, at her third application.

The Israeli parliament (knesset) decided June 13, 1950, against the adoption of a written constitution. From Sept. of the same year, nearly all the land of Israel was placed under national ownership.

Fighting which occurred in June, 1948, between Hagana, reconstituted the regular Israeli defence force, and the terrorist body Irgun (see Palestine in main text) led the provisional govt. on June 24 to outlaw all armed bodies except Hagana. Irgun thereupon announced that it did not recognize the provisional govt., but on Sept. 2 expressed willingness to disband. On Sept. 17, Count Folke Bernadotte, (q.v. in main text), U.N. mediator in Palestine, was assassinated in Jerusalem. The Stern gang claimed responsibility for this crime. Outlawry was specifically applied to it, and 200 persons suspected of membership were seized on Sept. 18. Irgun, warned that if its members did not surrender all arms and equipment they would be similarly named as outlaws, transformed itself into the Heruth (freedom) political party. Nathan Yellin, leader of the Stern gang, and his second in command Matatiah Shmulevitz, were arrested in Haifa on Sept. 30. On Feb. 10, 1949, a military court sentenced them to eight and five years' imprisonment respectively; they were released immediately under an amnesty for all prisoners not serving life sentences.

A census taken on Nov. 8, 1948, showed the pop. to be 842,000, of whom only 69,000 were non-Jewish. All persons of both sexes over 18 included in this census were eligible to vote at the general election held Jan. 25, 1949, for a constituent assembly; the Labour party, led by Ben-Gurion, gained 46 out of the 120 seats in this assembly, which met on Feb. 14 in Tel Aviv, and adopted a provisional constitution, Feb. 17. Weizmann was elected first president of the new republic. Ben-Gurion resigned, and formed a new coalition govt.

More than 150,000 immigrants entered Israel during 1948, 243,000 during 1949, and some 200,000 during 1950. They came principally from Germany, from the eastern countries of Europe, and from the Arab countries, including North Africa. Immigrants from the U.S.A., S. America, and the British Commonwealth numbered only a few thousand altogether.

National service for men (two years) and women (one year) between the ages of 18 and 26 was

introduced Sept. 8, 1949. On Sept. 19, 1949, Israel devalued the Israel pound (equivalent to the pound sterling, and introduced Aug. 17, 1948), in conformity with the pound sterling.

Tel Aviv, the temporary capital, was amalgamated with the almost deserted city of Jaffa, Oct. 4, 1949, under the name Jaffa-Tel Aviv.

The prime minister moved his office to the Jewish-held new city of Jerusalem, Dec. 14, 1949. Several other ministries followed, and parliament reassembled there Dec. 26. On Jan. 23, 1950, Jerusalem was proclaimed capital of the Jewish state.

Military action between Israel and her Arab neighbours, and diplomatic action by the U.N., are described under Palestine in N.V.

Italy. During 1947 the govt. of A. de Gasperi was confronted increasingly by strikes and other demonstrations fostered by the Communist party and the Communist-controlled trade union organization, the confederation of labour. In May, 1947, the ministry had been re-formed to exclude all Socialist and Communist representation, though the following Dec. a further rearrangement gave places to the so-called Moderate Socialists (as distinct from the Left-Wing Socialists, under Nenni, who threw in their lot with the Communists to form the popular democratic front). Disorders reached a climax in Nov. with serious rioting, directed chiefly against right-wing party offices and newspapers, in Milan, Genoa, and other cities, and notably throughout Apulia. A second wave of violence and revolt followed the attempt in July, 1948, to assassinate the Communist leader Togliatti in Rome. There was fighting in Genoa, Turin, Florence, Naples, Venice, and other centres, with loss of life and many other casualties.

Meanwhile, before the eyes of an anxious world, Communism in Italy had received a notable setback in the general elections of April, 1948. These brought a big victory for de Gasperi and his Christian Democrats, with 307 seats in the chamber against the 182 of the popular front, the other parties securing only 85 seats between them. The C.D. victory in the senate was equally marked. In Aug., 1948, the popular front was dissolved. On May 12, 1948, Luigi Einaudi (q.v. in N.V.) took the oath as second president of the republic.

De Gasperi continued in office, with various cabinet changes, throughout 1949. In Jan., 1950, he headed a new coalition govt. from which Liberals and left-wing Christian Democrats were excluded. Faced with large-scale unemployment (over 2,000,000 at the end of 1949), and with serious unrest among the peasants of southern Italy, the govt. announced in March 1950, a programme of reform

A 10-year plan for relieving unemployment in, and developing, the depressed areas of the country was laid before parliament: this included land reclamation and irrigation projects, and construction of new roads, aqueducts, and hydro-electric plants. Under a national land reform bill, more than 3,000,000 acres were to be made available to landless peasants and agricultural workers.

Italy's application for membership of the U.N. was vetoed by the U.S.S.R. in Oct., 1947. The country, which had been obliged to endure successive devaluations of the lira, participated in the European Recovery Programme. Italy was a signatory of the North Atlantic Treaty (g.v. in N.V.), and was one of the nations which sponsored the constitution (Aug., 1949) of the Council of Europe. A Franco-Italian agreement preparatory to a proposed full customs union between the two countries was signed in Rome, March 7, 1950. An arrangement whereby letters and postcards might be sent from one country to the other at inland postal rates came into force June 1.

After debating the future of former Italian colonies the U.N. general assembly in Nov., 1949, decided that Libya should become independent by 1952 and that Italian Somaliland should be placed under Italian trusteeship for 10 years (1950-60); a special commission appointed to study the future of Eritrea recommended, Nov., 1950, that the country should become a federal unit of Abyssinia. On April 1, 1950, after nine years of British military administration, Italian Somaliland was transferred to Italian administration.

Jackson, Sir Barry. British theatre manager. He ceased to direct the Shakespeare Memorial Theatre after the 1948 season; in 1949 he became a trustee of the Royal Opera House, Covent Garden.

James, Henry. Anglo-American novelist. Lamb House, Rye, Sussex, his home from 1897 to 1916, was given in 1950 to the National Trust, to be preserved as a museum.

Japan. Rapid progress was made under Allied (chiefly U.S.) occupation in the conversion of Japan into a democratic state on the western model. The great industrial monopolies and feudal estates were broken up. The general elections of 1946, in which women voted for the first time, brought victory to the moderate parties. The supreme commander of the occupying forces, Gen. MacArthur, viewing the pre-war record of the Liberal leader, would not allow him to form a govt., and another Liberal, Shigenu Yoshida, did so. The new diet included 39 women.

The new constitution was adopted in Oct., 1946, and came into force May 3, 1947. Meanwhile, in view of the rapidly changing structure and economic situation

in Japan, further general elections were held, May, 1947, both for the new upper house, the house of councillors, and for the house of representatives. As a result the Socialists became the strongest party in the lower house, with 143 seats, but no majority. In the house of councillors Independents (most of them Conservative) gained a clear majority. Tetsu Katayama became the first Socialist premier over a coalition ministry of Socialists and Democrats (formerly Progressives), the Liberals declining to cooperate. Katayama announced his hope that his govt. would prove to be "founded on moral ethics and based on humanism," but upon dissensions in his own party the govt. resigned Feb., 1948. Hitoshi Ashida, leader of the Democrats, formed a second coalition. This lasted only a few months before it was obliged to resign following disclosure of a bribery scandal in which several members were said to be involved. Meanwhile the former Liberal party had fused with those members of the Democratic party who did not support the coalition, to form a new Democratic Liberal party, essentially conservative in policy, with the former Liberal premier Yoshida at its head. Yoshida now returned to the premiership and formed a Democratic Liberal govt., which, however, was in a minority. But the elections of Jan., 1949, gave this right-wing party an overwhelming majority.

Opposition to the govt.'s "austerity" programme, the dismissal of 80,000 employees from railway and other govt. enterprises, and the return from the Soviet Union of prisoners of war indoctrinated with Communism led to increased Communist activities during 1949, and these in turn to the passing of an anti-strike bill and other anti-Communist measures by the govt.

Detailed figures of Japan's losses and casualties in the Second Great War, issued April 19, 1949, showed that about 40 p.c. of the aggregate urban areas were damaged, with 2,252,000 buildings totally destroyed, 695,000 in Tokyo alone. Loss of human lives was estimated at 1,850,000 (1,555,000 military); injured numbered 7,990,000.

Jacques - Dalcroze, Emile. This Swiss musician, originator of eurhythmics, died at Geneva, July 2, 1950.

Jensen, J. V. This Danish author died Nov. 25, 1950.

John, Augustus Edwin. This British painter pub. the autobiographical *Many-coloured Life*, 1951.

Joliot, Frédéric. This French physicist (who, after his marriage to Irène Curie, took the name Joliot-Curie) was appointed high commissioner for atomic energy in France in 1946. In 1950 he, and in 1951 his wife, were removed from the commission owing to their

membership of the Communist party.

Jolson, Al. This American singer died in San Francisco, Oct. 23, 1950. In two films based on his life story—*The Jolson Story*, 1946, and *Jolson Sings Again*, 1949—Larry Parks acted the part of Jolson, who himself recorded the songs.

Juin, Alphonse Pierre. This French soldier was in Jan., 1951, appointed inspector-general of all French armed forces, remaining at the same time resident-general in Morocco.

Juliana. The queen of the Netherlands, accompanied by her husband, paid a state visit to London, Nov. 21-23, 1950.

Kashmir. Sir Owen Dixon, after spending nearly four months in the capitals of India and Pakistan in unsuccessful efforts to compose the differences of those countries over Kashmir, left Karachi, Aug. 23, 1950. He presented to the U.N. security council on Sept. 19 a report including a recommendation that "the initiative should now pass back to the parties."

The Kashmir dispute was a subject of informal discussion at the conference of Commonwealth prime ministers in Jan., 1951.

Kaye, Danny (b. 1913). American actor. Born Daniel David Kominsky, Jan. 18, 1913, in Brook-



lyn, New York city, he was educated locally and had various occupations until his talent for mimicry and clowning brought him engagements as an entertainer at private functions, in hotels, and in night clubs. He played in *Straw Hat Review*, *Ambassador Theatre*, New York, 1939; *Lady in the Dark*, 1940; *Let's Face It*, 1941; and had a great success at the *London Palladium* in 1948 and 1949. Typical of his films were *Up In Arms*, 1943; *Wonder Man*, 1944; *Kid from Brooklyn*, 1945; *The Secret Life of Walter Mitty*, 1946; *A Song is Born*, 1949; *The Inspector-General* 1950.

Kennet, 1st Baron. The diaries and memoirs of Lady Kennet (Kathleen, Lady Scott) were pub. 1949 under the title *Self Portrait of an Artist*.

Keyes, 1st Baron. A plaque in the crypt of St. Paul's cathedral commemorating Lord Keyes and his son Geoffrey was unveiled by W. S. Churchill, 1950.

Keynes, J. M. Keynes, Baron. *Consult Life*, R. F. Harrod, 1951.

Khan, Liaquat Ali (b. 1895). First prime minister of Pakistan. Born Oct. 1, 1895, at Karnal,



He joined the Muslim League, 1923, became its hon. gen. sec., 1936, and was its deputy leader in the central legislative council from 1940 and Jinnah's right-hand man. Finance minister in the interim govt. of 1946, he attended the London conference of 1946 that considered the future of British India, and became prime minister and minister of defence of Pakistan on the formation of that dominion, 1947. He was elected president of the Muslim league in 1950. He attended the London conferences of Commonwealth prime ministers, 1948, 1949 and 1951, and paid official visits to the U.S.A. and Canada in 1950.

Kierkegaard, S. A. Kierkegaard Studies, T. H. Croxall, 1948, was the first full-length study of Kierkegaard's philosophy to be published in the U.K. Consult also Pascal and Kierkegaard, D. Patrick, 2 vols., 1948.

Kildare. Co. of Eire. In 1947 the co. was given three members in the Dáil.

Kilkenny. Co. of Eire. With co. Carlow, Kilkenny was in 1947 given five members in the Dáil.

King, W. L. MACKENZIE. Canadian statesman. He died at his home near Ottawa, July 22, 1950.

Korea. Under an agreement between the U.K., U.S.S.R., and the U.S.A. made in Moscow, 1945, a joint commission of the U.S. and Russian commands in Korea was set up Feb. 6, 1946, with the duty of consulting representatives of Korean democratic parties and making proposals for a four-power (U.S.A., U.S.S.R., U.K., and China) trusteeship, lasting up to five years, before the grant of full independence to Korea. After disagreements over the form and method of choosing an interim govt., this commission suspended its sittings in May, and the U.S.A. referred the problem to the U.N.

In Nov., 1947, the general assembly of the U.N. adopted a resolution advocating the holding of elections, under U.N. observation; the formation of a Korean national govt. with its own security forces; and the withdrawal of all occupation forces within 90 days of the elections. On the committee of observation appointed were representatives of Australia, Canada, China, Salvador, France, India, the Philippines, and Syria; the Ukraine, invited to serve, refused.

This U.N. commission was refused admission to the Russian

Punjab, he was educated at the Mahomedan Anglo-Orient College, Aligarh, and at Exeter College, Oxford, being called to the bar at the Inner Temple in 1922. He joined the Muslim League, 1923, became its hon. gen. sec., 1936, and was its deputy leader in the central legislative council from 1940 and Jinnah's right-hand man. Finance minister in the interim govt. of 1946, he attended the London conference of 1946 that considered the future of British India, and became prime minister and minister of defence of Pakistan on the formation of that dominion, 1947. He was elected president of the Muslim league in 1950. He attended the London conferences of Commonwealth prime ministers, 1948, 1949 and 1951, and paid official visits to the U.S.A. and Canada in 1950.

Withdrawal of Allied Forces

An insurrection in S. Korea was suppressed by the southern govt. in Oct., 1948; but in Nov., after learning that S. Korea was menaced by 250,000 Communist-led N. Koreans, with troops already stationed along the 38th parallel, the S. Korean assembly asked the U.N. to allow American troops to remain after the Russians had withdrawn from the N. Instead, the U.N. general assembly declared the S. Korean govt. to be the legal, effective, and only freely elected govt. in Korea, replaced the temporary commission of observation by a permanent one, and recommended the immediate withdrawal of all occupation forces. The Russians announced that their last troops left on Dec. 25, 1948. The departure of the last U.S. occupation forces, June 29, 1949, was followed by fighting along the 38th parallel, and in Sept. a report by the U.N. commission stated that the danger of civil war was serious.

On June 25, 1950, N. Koreans invaded S. Korea. An emergency meeting of the security council was held the same afternoon. The Russian delegate (who had attended no meetings since Jan.) was absent. By nine votes to nil, Yugoslavia abstaining, the invasion was declared a breach of the peace. The council called for an immediate cessation of hostilities, and asked all member states "to render every assistance to the U.N. in the execution of this resolution."

On June 26 Pres. Truman announced that he had received a formal appeal for military aid from the Korean ambassador; and on June 27 he stated that he had ordered U.S. air and sea forces to support the S. Korean forces. Simultaneously the appointment of Gen. MacArthur to command operations in Korea was announced, and the same day the security council voted, seven to one, for military sanctions against N. Korea. British naval support was announced June 28, naval units reaching Korean waters on July 2.

By July 4, 41 member states of the U.N. (including all countries of the British Commonwealth) had expressed support for the U.N. standpoint. Russia, Czecho-Slo-

vakia, Poland, and Yugoslavia opposed it, Egypt and the Yemen remained neutral. Italy, though not a member of the U.N., expressed agreement. From Moscow it was asserted that the S. Koreans were responsible, and the U.S.A. was accused of aggression.

The invaders, far more numerous than, and with superior weapons to, the U.N. troops hurriedly sent to Korea, captured Seoul, June 28. American ground troops made their first contact with the invaders July 5; British ground troops reached Korea on Aug. 30. Turkey, Australia, New Zealand, Siam, France, Greece, Israel were among other nations who sent help in some form. The invaders pushed on, and by early August had reached a line roughly running due W. to the Nakdong (Rakuto) R. from a little N. of Pohang (Kokai) on the E. coast, then due S. along the Nakdong and to the S. coast west of Masan. Here, with local gains and losses, they were held by the U.N. forces until mid-Sept., when reinforcements made it possible for MacArthur to land forces at Inchon (Jinsen) at dawn on Sept. 15, and take Seoul Sept. 26. By the end of the month, U.N. forces were again at the 38th parallel, and on Oct. 1, S. Korean troops crossed it, followed by other U.N. troops. N. Korean resistance crumbled, U.S. troops taking Pyongyang, the northern capital, Oct. 19. U.N. forces pushed on into N. Korea, and MacArthur anticipated the end of the campaign by Christmas. Then Chinese troops began to appear in support of the N. Koreans (Oct. 27). At first a few thousand "volunteers," by the end of Nov. Communist Chinese troops in Korea were estimated at half a million. The U.N. armies were compelled to retreat.

MacArthur demanded the branding of Communist China as an aggressor; but the U.N. security council hesitated to attempt this step. A Chinese Communist delegation arrived at Lake Success Nov. 28, but refused to discuss any subject except those it had been sent to discuss, Formosa and the entry of representatives of the Communist govt. into the U.N.

Seoul fell to the Communists again on Jan. 3, 1951, but to the south U.N. forces put up determined and successful resistance.

No military attacks were made on China; but the Communist govt. rejected repeated U.N. attempts to secure a cease-fire, and on Jan. 18, 1951, President Truman pressed for the branding of China as an aggressor. After amendment in the political committee, a U.S. proposal to this effect was endorsed by the general assembly (44 to 7, 9 abstentions), Feb. 1. Consideration of possible sanctions was deferred.

Kravchenko Case. A Russian, Victor Kravchenko, who went in 1943 to the U.S.A. with a Soviet

purchasing commission, became a political refugee in 1944, and pub. a book entitled *I Chose Freedom*, giving a personal account of life and govt. in the Soviet Union. This had an enormous initial sale in the U.S.A., the U.K., and elsewhere. In April and Nov., 1947, and again in April, 1948, there appeared in the pro-Communist French periodical *Les Lettres Françaises* a series of articles attacking Kravchenko. It was alleged that he was incapable of writing the book and that it was the work of American agents; further it was alleged that Kravchenko was a tool of the U.S. secret service; "a drunkard, liar, and traitor"; that he had been dismissed from a factory in Russia for moral reasons and had been found guilty of dishonest practices.

Kravchenko brought a libel action against the paper, and after hearings in Paris which lasted from Jan. 24 to April 4, 1949, judgement was given in his favour. The defendants — the manager and editor of the periodical — were ordered to pay 150,000 francs damages, a fine of 10,000 francs, and costs, and to print the court's judgement on the front page of *Les Lettres Françaises*. The Paris appeal court on Feb. 6, 1950, while upholding the fine, reduced the damages to one franc; the court held that the original damages were not justified in view of the increased sales of his book through the publicity given to the court case.

As is usual in French courts, many matters extraneous to the action for libel were brought forward, particularly allegations against the Soviet system and conditions in Russia. Among witnesses for the defence were Gen. Rudenko, Kravchenko's former chief in Washington and the chief Russian prosecutor in the Nuremberg trials; F. Joliot-Curie, then head of the French atomic energy commission; K. Ziliacus, at that time M.P. for Gateshead; and Hewlett Johnson, dean of Canterbury. Evidence concerning the Soviet regime given by witnesses for the prosecution made a great impression on public opinion and was damaging for the French Communist party. Kravchenko's own account of the case was published in the U.S., 1950, under the title *I Chose Justice*. Consult also Kravchenko v. Moscow, Sir T. Humphreys, 1950.

Krupp. ALFRED KRUPP VON BOHLEN was freed Jan. 31, 1951, and the confiscation of his property cancelled, by the U.S. authorities in Germany.

Laidlaw, DANIEL. This Scottish piper, a V.C. of the First Great War, died June 2, 1950, aged 74.

Lake Success. The secretariat of the U.N. moved to the United Nations building in N.Y.C. Jan. 11, 1951.

Larwood, HAROLD. English cricketer. He emigrated to Australia in April, 1950.

Lascaux. Locality in Dordogne, France, where remarkable cave paintings were discovered in 1940. Situated in a wooded hill overlooking Montignac, on the Vézère, the cave was discovered by chance by four boys, Sept. 1940. The main cavern measures roughly 90 ft. in length and 30 ft. in width, and its walls are decorated with prehistoric drawings of horses, cows, bulls, and a bear, which are painted in black, red, and ochre. In an excellent state of preservation, the lifelike representations of these animals, which, it is believed, were etched with pointed flints, are calculated to date back some 20,000 years and are about 2,000 years older than the celebrated paintings in the Altamira caves, Spain. Consult *The Lascaux Cave Paintings*, F. Windels, 1950; *Lascaux: A Commentary*, L. Drummond, 1950.

Lavalleja. Later name of the town in Uruguay formerly called Minas (*q.v.* in main text).

Lawrence Trophy. The award of this trophy for the fastest century in first-class cricket fell into abeyance in 1939. In 1950 a London newspaper instituted another trophy for the same feat with a prize of £100 if the winner was a professional.

Layton, WALTER THOMAS LAYTON, BARON. He resigned the chairmanship of the News Chronicle and Star in April, 1950, remaining on the board of the Daily News Ltd.

Leahy, WILLIAM DANIEL. In 1949 this American admiral resigned his post as chief-of-staff to President Truman. His volume of war-time memoirs, *I Was There*, was published, 1950.

Lehman, HERBERT H. U.S. politician. He became a senator for New York state, Nov., 1949.

Leitrim. Co. of Eire. With co. Sligo, Leitrim was, in 1947, given five members in the Dáil.

Leopold III. King of the Belgians. On April 15, 1950, in a speech broadcast to the Belgian nation, Leopold (then in Switzerland) suggested that after parliament had asked him to resume his constitutional functions, he might delegate his powers for a time to his son Baudouin. Following a general election (*see* Belgium in N.V.), Leopold was invited to return to Belgium, and, after some delay, agreed, Aug. 1, to delegate his powers to Baudouin pending that prince's accession to the throne on attaining the age of 21 (Sept. 7, 1951); and retired into private life.

Lewis, CECIL DAY. He was elected professor of poetry at Oxford, 1951.

Lewis, (PERCY) WYNDHAM. This British painter pub. the autobiographical *Rude Assignment*, 1950.

Lewis, SINCLAIR. This American novelist died Jan. 10, 1951.

Liberté. French liner. *See* Europa in N.V.

Libya. A constituent assembly of 20 delegates each from Tripoli-

tania, Cyrenaica, and the Fezzan met in Tripoli Nov. 25, 1950, and on Dec. 3 proclaimed Mohamed Sayed Idriss el Senussi as king-designate of united Libya.

Liddell Hart, B. H. British writer on military topics. In 1948 he published *The Other Side of the Hill*, an examination of documents by German generals relating to the Second Great War; his *Defence of the West* appeared in 1950.

Livingstone. Town of N. Rhodesia. A new airport was opened here in August, 1950.

Local Government and Planning, MINISTRY OF. Name given in Jan., 1951, to the ministry of Town and Country Planning (*q.v.* in main text).

Longford. Co. of Eire. With Westmeath, Longford was in 1947 given five members in the Dáil.

Long Service and Good Conduct Medal. Name of two separate British awards instituted by royal warrant in 1950. One, also known as the Royal Observer Corps medal, is granted to members of that corps who complete twelve years' satisfactory service. Allowance is made for those whose service was interrupted by service in the armed forces. Special constables who did observer duties in the Second Great War are also deemed eligible. The medal has on the obverse an Elizabethan coast-watcher standing beside a signal beacon, holding a torch; reverse, a crowned effigy of the sovereign. The ribbon is dark blue, light blue, and silver-grey.

The second long service and good conduct medal, the Cadet Forces medal, is for officers, chief petty officers, and adult warrant officers completing twelve years' satisfactory service in or with cadet units. This medal, made of cupronickel, is circular, bearing on the obverse the royal effigy crowned, and on the reverse a torch. The ribbon is green edged with yellow, with superimposed narrow stripes of dark blue, red, and light blue. A clasp is awarded for each additional qualifying period of twelve years. Service with a cadet unit in war-time counts as double.

Louis, JOM. American boxer. In 1950 he was beaten on points over 15 rounds by Ezzard Charles in a fight for the world heavy-weight championship.

Lovelock, JOHN EDWARD (1910-49). New Zealand athlete. He was born at Temuca, New Zealand, and after attending Timaru high school and Otago university he became a Rhodes scholar in Exeter College, Oxford, in 1931. Later he studied medicine at St. Mary's hospital, London. In 1932 he set up a British mile record of 4 min. 12 sec., and in the following year ran his world's record mile of 4 min. 7.6 sec. at Princeton, New

Jersey. In the Berlin Olympic Games of 1936 he won the 1,500 metres in the Olympic record time of 3 min. 47.8 sec. After serving in the Second Great War in the R.A.M.C. and A.P.T.C., in 1947 he took a post in Manhattan hospital, New York. He was killed when he fell in front of an underground train at Brooklyn, Dec. 28, 1949.

Lucerne. Canton of Switzerland. Pop. (1950) 223,409.

Lupescu, MAGDA. She was deprived of Rumanian citizenship by a Bukarest decree of 1948. On Aug. 18, 1949, a religious marriage was solemnised between her and the ex-king Carol, at Estoril, Portugal, and it was announced that she would take the title princess and the name Helena.

Luzon. The capital of the Philippine republic was formally transferred from Manila to Quezon City, July 17, 1948.

Lynskey Tribunal. Judicial tribunal appointed by the British govt. in 1948 to investigate allegations of irregularities in govt. depts. involving ministers of the crown and other public servants. It was composed of Sir George (Mr. Justice) Lynskey, as chairman, and two eminent K.C.s, and sat at Church House, Westminster, in Nov.-Dec. Their report found that J. Belcher, parl. sec. to the board of trade, and G. Gibson, a director of the Bank of England, had acted irregularly in certain instances, the former under a sense of obligation following the receipt of gifts and hospitality from a certain Sidney Stanley, the latter in the hope of material advantage. Both men had resigned the offices mentioned before the report's publication. All other ministers and public servants cited were wholly exonerated.

The tribunal's report was adopted by the house of commons with only one dissident. Belcher made a personal statement and announced his intention of giving up his seat.

A committee set up by the govt. in Feb., 1949, to investigate the activities of "contact men" reported in March, 1950, that in the U.K. such people are few in number, that their activities were normally reputable, nor were they on a scale that would justify any general restrictions on them.

Lytton, NEVILLE STEPHEN, 3rd earl Lytton, died in Paris Feb. 9, 1951, and was succeeded by his only son, Noel Anthony Scawen (b. April 7, 1900).

MacArthur, DOUGLAS. U.S. soldier. He was appointed supreme commander in charge of U.N. operations against North Korea, June, 1950. See Korea in N.V.

MacCarthy, DESMOND. This British literary critic was knighted, 1951.

McCracken, SIR FREDERICK W. N. This British soldier died Aug. 8, 1949.

McCreery, SIR RICHARD LONDON. He retired from his post on the military staff committee of the U.N., 1949, in which year he was created G.C.B.

McCulloch, DEREK I. B. He resigned from the B.B.C., 1950, to join the News Chronicle.

Madhya Bharat. State of India. Pop. (1950 est.) 7,870,000.

Madhya Union. State of India (formerly Central Provinces). Pop. (1950 est.) 20,920,000.

Madras. State of India. Pop. (1950 est.) 54,290,000.

Malaya, FEDERATION OF. A series of acts of terrorism and lawlessness by the so-called Malayan People's Anti-Japanese Army (originally a Communist resistance army formed during the war by Chinese resident in Malaya), with h.q. in jungle areas, assumed serious dimensions from May, 1948. European plantation managers, Chinese non-Communists, and Malayan trade unionists were murdered; there were also many Communist-inspired strikes on rubber plantations and in mines. The govt. of Malaya declared the Pan-Malayan trade union federation illegal, and proclaimed a state of emergency in certain districts, among other measures imposing the death penalty for unauthorised possession of arms. British army reinforcements were sent to assist police and Gurkha troops in a drive against the terrorists in the jungle. Units of the R.A.F. also took part.

The Communist victory in China at the end of 1949 encouraged the leaders of the Malayan Communist movement, and from the beginning of 1950, despite increasing government activity, the number of bandit incidents grew progressively higher. In April, 1950, it was announced that since June, 1948, 1,138 bandits had been killed, 645 had been captured, and 359 had surrendered; the number of armed bandits still operating was estimated at 3,000. During the same period 323 police, 154 members of the fighting services, and 803 civilians were killed. Reinforcements of ground troops and air transport were dispatched from Britain and Hong Kong, and in April Lt.-Gen. Sir Harold Briggs (late of the Indian Army) was given wide powers to direct operations. The "Briggs plan" launched in June involved complete co-ordination between army, police, and the civil administration, and the reinforcing of security measures with the object of bringing security to all populated areas. Important in this connexion were plans for the regrouping of settlements of Chinese squatters who, often living in remote jungle regions, were terrorised into providing the bandits with supplies. New regulations by the Federal govt. imposed the death penalty from June 1, 1950, on agents found collecting or receiving money, food, or clothes for terrorists.

In face of these difficulties great progress was made in the restoration of the war-damaged tin and rubber industries, Malaya becoming the chief dollar-earner of the countries of the British commonwealth. A five year plan of research and development in the rubber industry was announced Jan. 1, 1950.

The University of Malaya came officially into existence on Oct. 8, 1949, when the opening ceremony was held at Raffles College, Singapore. Malcolm MacDonald, high commissioner in S.E. Asia, was appointed the first chancellor.

Malmesbury, EARL OF. The 5th earl died June 12, 1950, and was succeeded by his son, William James (b. 1907).

Malta. Consult also Malta: an Account and Appreciation, Sir Harry Luke, 1949.

Man. Discoveries have clarified some of the most important problems of human evolution. In Kenya there have come to light remains of extinct apes of the Miocene period (estimated to be 20-30 million years old). These early apes were much more primitive than those which exist today; in particular, their limbs did not show the extreme modifications for arboreal life such as are found in modern apes. This seems to dispose of the difficulty which some anatomists have felt regarding the conception of man's descent from a simian ancestor, their argument being that it is unlikely that limbs of a human type could have been derived from the highly specialised limbs characteristic of the modern apes. The E. African discoveries now make it clear that in the Miocene apes (from some group of which it is probable that the human stock was derived) the limbs were by no means so highly specialised.

In S. Africa many more remains of the Australopithecinae were excavated—by 1950 more than 30 skulls or portions of skulls, large numbers of teeth, and several limb bones. All this new material confirms the earlier conclusions regarding these extinct ape-like creatures. They had small brains, hardly exceeding in size that of a gorilla, and massive jaws. By contrast, the teeth (in spite of their size) were essentially human in structure and closely similar to those of primitive hominids such as *Pithecanthropus*, while many of the anatomical details of the skull approximate in a remarkable way to those characteristic of the human skull. The most impressive evidence, however, is provided by the pelvic skeleton. Three specimens of the pelvis found at three different sites were each associated with other Australopithecine remains. All three specimens are predominantly human in their general shape (though at the same time they also show some curiously primitive

features). Together with evidence of thigh-bone fragments also found, and of certain details of the base of the skull, the pelvic skeleton removes any further doubt that the Australopithecinae were capable of standing and walking in approximately human fashion. There is good reason, indeed, to suppose that they represent the earliest phase in the evolution of the human family so far discovered.

New evidence came to hand in 1949 in support of the contention of the original discoverers that the Piltdown skull (predominantly human in its general characters) and the Piltdown jaw (regarded by some authorities as that of an ape) really do belong to the same individual. This evidence depends on the analysis of the fluorine content of the fossil bones, which has been found to be identical in all the fragments. On the other hand, this chemical test has also made it clear that the Piltdown man is not nearly so ancient as had been supposed; probably he existed no earlier than the last interglacial phase of the Pleistocene period.

At Swanscombe in Kent, and at Fontécheval in the Charente district of France, there have been found portions of human skulls which definitely antedate the Mousterian period of Neanderthal man. Both skulls are very similar to that of *Homo sapiens* and show no Neanderthal characteristics. These discoveries confirm the supposition that the extreme types of Neanderthal man played no part in the evolution of *Homo sapiens*, but are rather to be regarded as an aberrant side-line of evolution which ultimately became extinct. On the other hand, the famous Galley Hill skull, which had been accepted by some anthropologists as evidence for the great antiquity of *Homo sapiens*, has now been shown by the fluorine test to be comparatively recent—probably of Neolithic date. Further discoveries of *Pithecanthropus* made in Java confirm the general conclusion that this early type was essentially human, though showing many primitive characters such as small brains, large jaws, and a retreating forehead. At the same time, they suggest that these primitive hominids may have shown considerable diversity of form.

Manila. The capital of the Philippine Republic was formally transferred from Manila to Quezon City, July 17, 1948.

Manipur. State of India. Pop. (1950 est.) 540,000.

Manitoba. In May, 1950, floods in the Red River valley did great damage to a large area of southern Manitoba, including the city of Winnipeg.

Mannerheim, G. C., BARON. This Finnish soldier died at Lausanne, Jan. 27, 1951.

Mao Tse-tung (b. 1893). Chinese Communist leader. Born at Shaoshan, Hunan, 1893, the son of a farmer, he was educated at Chang-



sha normal school and was a teacher for a short time. He joined the Chinese Communist party in 1921, and during 1922-27, when the Communists allied themselves with Chiang Kai-shek's Kuomintang, devoted himself to spreading Communist doctrine amongst the peasants of Hunan and the neighbouring provinces. In 1927 Chiang turned against the Communists, and most of their surviving leaders went into hiding; but Mao armed his peasants and, though he suffered reverses, managed to form a Communist administration in Kiangsi. In 1934, to escape the Kuomintang forces, he led his army on a march of 6,000 miles to Yenan, in Shensi prov., some 85 m. S.E. of the Great Wall. There he formed a Communist govt.

When the Japanese attacked China, 1937, he cooperated with Chiang's national govt. against the enemy; but friction soon developed, and Mao continued to extend the area of Communist domination within China. After Japan's surrender, 1945, Chiang invited him to Chungking in the hope of achieving unity, but in 1946 the Communist armies started a general offensive towards Manchuria, and relations with the national govt. were completely severed March, 1947. By Feb., 1948, Mao had virtual control of Manchuria, and nationalist forces were deserting to him in large numbers. Invading China proper, the Communists captured Peiping (Peking) Jan. 22, 1949, and by the end of that year Chiang's authority had been eliminated throughout the Chinese mainland. On Oct. 1, 1949, the people's republic of China was inaugurated at Peking, with Mao as chairman of the central govt. and head of state. On Feb. 14, 1950, after several weeks of negotiation in Moscow, he signed a 30-year treaty of friendship, alliance, and mutual assistance between the U.S.S.R. and Communist China. See China and Korea, both in N.V.

Mark. German currency unit. In June, 1948, the inflated currency was again reformed by the cancellation of Reich debts to about 400,000 million Reichsmarks (at the original official rate, £40,000 million), and by reducing cash and bank deposits to 10 p.c. (at best) of their nominal value in new *deutsche* marks in the three western zones of occupied Germany, less drastically by new *ost* marks in the Russian zone. The official rate of exchange of the D.M. was

12:35 to the £. In Dec., 1948, one D.M. equalled approx. 3 O.M.

On Sept. 29, 1949, following the devaluation of the pound, the value of the D.M. was fixed at 11:76 to the £1.

Marshall, GEORGE CATLETT. U.S. soldier and administrator. He was appointed secretary of defence, Sept. 12, 1950.

Matrimonial Causes Act. See Divorce in N.V.

Maude, CYRIL. This British actor died at Torquay, Feb. 20, 1951.

Meath, Co. of Eire. In 1947 Meath was given three members in the Dáil, Westmeath being joined to Longford for electoral purposes.

Menzies, R. G. This Australian statesman was made C.H., 1951.

Mercury. British training ship. C. B. Fry, honorary resident director from 1908, resigned 1950.

Miaskovsky, NIKOLAI Y. This Russian composer died Aug. 9, 1950.

Michaelis, KARIN. This Danish writer died Jan. 11, 1950.

Milch, ERHARD. The life sentence passed on this German air officer was reduced Jan. 31, 1951, by the U.S. authorities in Germany to 15 years.

Miles, EUSTACE HAMILTON. This British food reformer died Dec. 20, 1948.

Military Service Acts. By an amending Act of Sept., 1950, the period of full-time service was extended to two years, followed by 3½ years in the reserve.

Millay, EDNA ST. VINCENT. American poet. She died in New York, Oct. 19, 1950.

Milne, EDWARD ARTHUR. This British scientist died in Dublin, Sept. 21, 1950.

Minot, GEORGE RICHARDS. This American physician died Feb. 25, 1950.

Moeran, E. J. This British composer died at Kenmare, co. Kerry, Eire, Dec. 1, 1950.

Montreuil. Town of France. A bronze statue of F.M. Earl Haig, unveiled in the market square here, 1931, was destroyed by Germans during the Second Great War, and replaced identically (from the same mould), 1950.

Mont Valérien. Hillock a few miles W. of Paris, where 4,500 hostages were shot by the Germans during their occupation of the city, 1940-44. It was consecrated as a national shrine June 18, 1946, when an "eternal flame" was lit by Gen. de Gaulle.

Müller, PAUL (b. 1899). Swiss chemist. Born at Basel, Jan. 12, 1899, he studied at the university there and in 1925 joined the staff of a local dyestuff company, carrying out research work in the laboratories. Owing to his interest in botany, he became concerned with the protection of plants against insects, and as a result of experiments ranging over a period of some 10 years he discovered the insect-killing properties of D.D.T.

He was awarded the Nobel prize for medicine, 1948.

Murder. An amendment to the Criminal Justice bill, 1948, proposed to suspend the death penalty for murder for a trial period of five years as a preliminary step to its abolition. A free vote of the house of commons approved this amendment, to the surprise of the country generally. The lords having deleted the clause, a compromise plan was introduced by the govt. by which murder offences would be divided into two categories, only those committed with "express malice" being punishable with the death penalty, together with those arising from certain clearly defined crimes, e.g. robbery, rape, resistance to the course of the law, obstruction of police or prison officers, also for second murder convictions. This compromise was also rejected by the lords, and a royal commission was set up in Nov., 1948, to inquire into the possible limitation of the death penalty. All criminals condemned to death were reprieved from April 16, after the passing of the first amendment by the commons, until Nov. 17. The Criminal Justice Act, July 30, 1948, made no change in the law relating to the death penalty.

Mysore. State of India. Pop. (1950 est.) 8,060,000.

National Health Service. Public service of the U.K., set up under the National Health Service Act, 1946. The object of this act was "to promote the establishment in England and Wales of a comprehensive health service designed to secure improvement in the physical and mental health of the people of England and Wales, and the prevention, diagnosis, and treatment of illness." Administered by the ministry of health, it brought into a single service the partial and incompletely coordinated services formerly provided by the general practitioner scheme of the old National Health Insurance Acts, the local authority clinic and domiciliary services, and the municipal and voluntary hospitals. The National Health Service (Scotland) Act, 1947, provided a similar service for Scotland, administered with slight differences in local organization by the Scottish office; an act, 1947, of the N. Ireland Parliament, applied the service to N. Ireland. The three acts came into force July 5, 1948.

The three parts of the health service were:

1. **Hospital and Specialist Service.** This welded into a single service the old voluntary and municipal hospitals, nearly all of which were vested in the minister. The non-teaching hospitals were placed under 14 regional hospital boards which delegate day-to-day management to hospital management committees. Each of the 36 teach-

ing hospitals was given its own board of governors. The hospital service provides without charge specialist services, for both in-patients and out-patients, together with domiciliary consultations where medically necessary. (Private and semi-private accommodation must be paid for.) All necessary drugs and appliances are also supplied without charge. Blood transfusion and mass radiography services are also provided.

2. **Local Health Authority Services.** The act centres all the clinic and domiciliary services on counties and county boroughs, which are designated local health authorities. The L.H.A. looks after expectant and nursing mothers and children under five, provides midwife, health visitor, home nurse, and domestic helper, an ambulance service and health centres; arranges for vaccination, immunisation, and the prevention, care, and after-care of disease. Some of these services are given without charge; for others the authority is empowered to make a charge.

3. **General Medical Service.** The act set up executive councils to administer the general medical, the general dental, the pharmaceutical, and the supplementary ophthalmic services. A list of doctors in any given neighbourhood willing to accept patients can be consulted at the local post office, or at the office of the executive council, whose address can be obtained at a p.o. Each doctor has a list of patients who have chosen him and whom he has accepted, and to whom he has agreed to give all ordinary general practitioner services. For each he receives a capitation fee; he makes no charge to the patient. Dental treatment is also given without charge. Necessary drugs, obtained through a pharmaceutical chemist or from the doctor, are supplied free. General practitioners may order some appliances. The supplementary eye service entitles patients to an eye-test and the supply of spectacles without charge; spectacles can also be obtained through the hospital service. A general practitioner obstetrician or the patient's usual doctor gives maternity care.

MEMBERSHIP OF COMMITTEES. Members of the various boards, committees, and councils are all appointed by, or after consultation with, appropriate bodies. They are selected from men and women having the necessary qualifications and experience who give their services, receiving only their expenses. A central health services council and a number of standing advisory and special sub-committees advise the minister.

FINANCE. The health service is in the main a charge on the exchequer. L.H.A. services are financed partly from the rates.

In 1948 only 8½d. of a man's contribution of 4s. 11d. under the National Insurance Act went to the health service. The national health service is thus not an insurance scheme; it is available to everyone, whether an insured person or not. See Beveridge Report; Health, Ministry of; Insurance, National (all in main text).

National Service. By an amending Act of Sept., 1950, the period of full-time service was extended to two years, followed by 3½ years in the reserve.

Nazimuddin, KHWAJA (b. 1894). Pakistan statesman. Born at Dacca, July 19, 1894, he was educated at Cambridge, became a barrister-at-law, and had a successful political career in Bengal, where he was successively minister of education, home minister,



and chief minister. He became a leading member of the Muslim league. Knighted 1934, he joined with other Muslim leaders in their renunciation of British titles in 1946. On the formation of Pakistan in 1947 he became prime minister of E. Bengal prov., and on the death of Jinnah in 1948 was appointed the second gov.-general of Pakistan, taking the oath Sept. 14.

Nazism. After appeals and retrials Schacht was acquitted, and Fritzsche and Papen were later set free on compassionate grounds. As late as 1949-50 certain *Gauleiters* and heads of Nazi party organizations were still being discovered in hiding, but in general denazification was completed. In the Russian-occupied zone of Germany there was a series of amnesties for former Nazis, many of whom joined the Communist party.

A recrudescence of the Nazi spirit was evidenced by replies in public opinion polls held in the U.S. zone, to the question "Was National Socialism merely a good idea badly carried out?" In 1946 40 p.c. answered "yes" to this question, in 1947 52 p.c., and in 1949 55½ p.c. At the time of the federal election of 1949 several quasi-Nazi parties began to appear.

Nelson, EARL. Albert Francis Joseph Horatio (b. Sept. 2, 1890) became 6th earl on the death of his father, Jan. 30, 1951.

Nepal. Differences between King Tribhuvana and his prime minister led in Nov., 1950, to the flight of the king with his eldest son and other members of his family. They took refuge in the Indian embassy at Kathmandu, and were flown to Delhi in an Indian plane. The king wished to democratise the govt.; the prime

minister rejected his proposals. But through the good offices of the Indian prime minister, Jawaharlal Nehru, better feeling was produced. Constitutional reforms were announced on January 7, 1951; and on February 15 the King with his family returned by air from Delhi to Khatmandu.

Neptune (planet). A second satellite was discovered, 1949, with the 82-in. reflector of McDonald observatory, Mt. Locke, Texas.

New Guinea. Talks at The Hague between Dutch and Indonesian delegates on the future of west (Netherlands) New Guinea broke down in Dec., 1950. The Indonesians demanded full and immediate sovereignty over the area; the Dutch wished to hold, at a time to be agreed, a plebiscite to decide the future of the country.

The eruption in N.E. New Guinea, Jan., 1951, of Mt. Lamington, 30 m. S.W. of Buna, caused deaths est. at more than 4,000, and devastation over an area 16 m. in diameter.

New Zealand. The legislative council, upper house of the N.Z. parliament, abolished itself from Jan. 1, 1951, by an act passed by 26 votes to 16, Aug. 18, 1950.

Nicola, ENRICO DE (b. 1877). First president of the republic of Italy. Born in Naples, Nov. 9, 1877, he studied law at the university there, and practised in criminal law. Deputy (non-party) for Afragola, 1909-24, he was president of the chamber 1920-23, and under-secretary of state under Orlando and Giolitti. Four times he declined an invitation from King Victor Emmanuel III to form a govt. During the fascist regime he retired from politics and resumed practice as a lawyer, accepting a senatorship, however, in 1932.

Acting on behalf of the committee of national liberation, he persuaded the king to abdicate in 1944. On the proclamation of the Italian republic, he was elected, June 28, 1946, provisional president. He was confirmed in office, 1947, but ill-health led him to resign in May, 1948.

Nightingale, FLORENCE. *Consult also* Florence Nightingale, C. Woodham-Smith, 1950.

Nile. In 1949 a new project was put in hand for using the headwaters of the Nile as a source of irrigation and electric power over wide areas of central and N. Africa. The project included the regulation of the Blue Nile; the use of Lake Tsana, Abyssinia, as a storage reservoir; a canal system by-passing the river-swamp region of the southern Sudan; and a dam at Owen Falls. See Owen Falls Dam in main text.

Nobel Prize. The 1950 prizes were awarded as follows:

Physics. Cecil F. Powell, professor of physics at Bristol uni-

versity, for his development of the photographic method for the study of nuclear processes and his work on mesons;

Chemistry. Otto Diels, former professor of Kiel university, and Kurt Alder, of Cologne university;

Medicine. Philip S. Hench and Edward C. Kendall (U.S.A.) and Tadeusz Reichstein (Switzerland) for contributions towards the discovery of cortisone (*q.v.* in N.V.);

Literature. Bertrand Russell (*q.v.* in main text);

Peace. Ralph Bunche (*q.v.* in N.V.).

The 1949 literature prize, which had been withheld, was awarded in 1950 to William Faulkner (*q.v.* in main text).

North Atlantic Treaty. A 20-years' defensive alliance formed in 1950 by 12 countries of North America and Western Europe. In March, 1949, the U.S.A., Canada, the U.K., France, Belgium, the Netherlands, Luxembourg, and Norway issued the text of a proposed pact for the collective defence of the North Atlantic area, and at their invitation Denmark, Iceland, Italy, and Portugal joined them. The treaty was signed in Washington by the 12 participating nations, April 4, 1949, and came officially into force Aug. 24. It was the first pact in history in which during peace-time the U.S.A. undertook commitments in Europe. Besides the home territories of the member nations, the agreement covered Algeria, Malta, and Gibraltar; the British, American, and French zones of Germany; the Anglo-American zone of Trieste; and island possessions of treaty powers in the Atlantic, such as Bermuda and the Bahamas.

At the head of the organization was the North Atlantic council of the foreign ministers of the 12 powers; this later appointed a council of deputies to be in continuous session. The council set up a defence committee (consisting of the defence ministers of member nations); a military committee (chiefs of staff or their deputies), with a sub-committee known as the standing group, having one representative each of the U.K., France, and the U.S.A.; and five regional planning groups. These covered (1) Northern Europe: the U.K., Norway, Denmark; (2) Western Europe: the U.K., France, Belgium, the Netherlands, and Luxembourg; (3) Southern Europe-Mediterranean: the U.K., France, Italy; (4) North America: the U.S.A. and Canada; (5) North Atlantic: all members except Italy and Luxembourg.

At a meeting of the North Atlantic council held in Sept., 1950, it was decided to create an integrated N. Atlantic defence force. Gen. Eisenhower was appointed, Dec. 18, supreme commander in Europe of N. Atlantic forces, taking up his duties early in Jan., 1951.

Nottingham, UNIVERSITY OF. This seat of learning originated as a university college founded in 1881, the first in England established by municipal action. In 1928 Sir Jesse Boot (later 1st Lord Trent) provided fine new buildings for the college on the west of the city. By royal charter the college was granted full university status in July, 1948, the 2nd Lord Trent being appointed the first chancellor in recognition of his father's benefactions. The university, with faculties of arts, pure and applied science, agriculture and horticulture, has over 2,000 students. In May, 1949, an appeal was launched for £1,000,000 in order to make the university wholly residential for men and women.

Oberammergau. The Passion play was revived in 1950, for the first time since 1934. *Consult* Oberammergau and its Passion Play, E. Corathiel, 1950.

O.E.E.C. Initials of Organization for European Economic Co-operation, which was set up in Paris, April 16, 1948, by the 18 nations participating in the European Recovery Programme (*q.v.* in N.V.).

Old Vic. War damage having been repaired, the theatre in Waterloo Road was re-opened in Nov., 1950.

Outward Bound Trust. British organization for promoting the training of lads from factories and secondary schools in open air activities. Founded in 1946, it originated in 1941 with the opening of the Outward Bound sea school at Aberdovey, Merionethshire. The Moray sea school was started at Gordonstoun, Scotland, 1948, and a mountain school at Eskdale, Cumberland, 1950. Outward Bound schools give short courses of training in walking, running, climbing, management of small craft, etc. to about 2,000 boys a year. The h.q. of the trust is at 40 Broadway, London, S.W.1.

Overseas Food Corporation. British organization for promoting the production of foodstuffs and agricultural produce outside the U.K. Established by the Overseas Resources Development Act, 1948, it was empowered to borrow up to £50,000,000 and was answerable to the ministry of food. One of its first duties was to take over the East African ground nut scheme, and in its report published in June, 1950, it was stated that the basic fault in the venture, which had cost over £30,000,000, was the failure to realize the impracticability of the original plans in the conditions obtaining after the Second Great War. Up to April 21, 1950, the corporation had been advanced £34,650,000, which sum included expenditure on the ground nut scheme, nearly £1,000,000 for the Queensland sorghum project, and

about £2,000,000 for railway and port work in East Africa. *See also* Colonial Development Corporation, Ground Nut Scheme, both in N.V.

Palestine. Eight hours before the British mandate ended at midnight on May 14-15, 1948, the Jews in Palestine proclaimed the new Jewish state of Israel (*q.v.* in N.V.).

Fighting had been going on between Jews and Palestinian Arabs since the publication of the U.N. partition plan for Palestine the previous Nov. Simultaneously with the ending of the mandate, the country was invaded by Egyptians from the S., the Transjordan Arab legion from the E., and a Syrian-Lebanese force from the N. The Egyptians took Gaza, May 16, and Beersheba, May 20; the Transjordan forces took Jericho, May 15, and entered Jerusalem, besieging the Jews in the old city until their surrender after bitter fighting, May 28. The Syrians took Samakh, S. of Lake Tiberias, May 17, but next day Israeli forces captured the Arab port of Acre.

The U.N., which had decided May 14 to appoint a mediator, chose Count Folke Bernadotte on May 20; and on the 22nd the security council called without effect for a cease-fire within 36 hours. A new U.N. resolution for a four-week truce, proposed by the U.K. and passed by the security council May 29, was accepted by Arabs and Jews on June 1, the cease-fire taking effect from June 11. By that date all the territory assigned to Israel under the U.N. partition plan (*see map* in p. 6302), except parts of the Negeb, was in Jewish hands, together with 400 sq. m. more.

Bernadotte established his h.q. in Rhodes, June 13; on the 16th he had consultations with the Arab league in Cairo, and on the 17th visited the provisional Israeli govt. at Tel Aviv. On the 28th he handed to Arab and Israeli representatives in Rhodes his proposals for a settlement, the principal provisions of which were: 1, the setting up of a union composed of a Jewish Palestine and an Arab Transjordan; 2, the Negeb in whole or in part to go to the Arabs; 3, W. Galilee in whole or in part to go to the Jews; 4, Jerusalem to be included in the Arab part of the union, with municipal autonomy for the Jewish community there, and special protection for the holy places. Both Israel and the Arab league rejected these proposals. The Arab league rejected also a U.N. proposal for the extension of the truce, due to expire on July 8, and on that day fighting was resumed. By the time it ceased again on July 18, under a U.N. threat to apply sanctions, the Jews had taken Nazareth, Lydda, and Ramleh, and secured all W. Galilee, thus greatly improving their military position.

Minor infractions of the cease-fire continued, especially in Jerusalem, and serious fighting flared up again during Oct. in the Negeb, the

Israelis taking Beersheba Oct. 21, and on the Lebanese frontier, where an Arab "liberation army" 5,000 strong was routed by the Israelis. In Dec. heavy fighting again broke out in the Negeb, and anxiety caused by Jewish violations of the Egyptian frontier led Transjordan to request the sending of, and the British govt. to send, Jan. 8, 1949, a small British force to the port of Akaba in Transjordan, at the head of the Red Sea and near the point where the frontiers of Transjordan, Palestine, and Egypt met. The previous day five British planes on reconnaissance on the Egyptian side of the border had been shot down by Israeli fighters, one British pilot being killed.

A proposal made by a group of Palestinian Arabs meeting at Jericho on Dec. 1, 1948, that Transjordan should be united with Arab Palestine under King Abdullah. was accepted by the Transjordan govt. and by the king.

Hashemite Kingdom of Jordan

Although other members of the Arab league strongly opposed the proposal, the union was formally endorsed, April 11, 1950, by a new parliament elected from both Transjordan (called officially the Hashemite kingdom of the Jordan from June, 1949) and the part of Arab Palestine under Jordanian control, and was recognized, subject to possible frontier adjustments in the final settlement of Palestine, by the U.K., April 27.

Abdullah's acceptance of this proposal disrupted the unity of Arab opposition to Israel, and negotiations conducted under U.N. chairmanship in Rhodes between Egypt and Israel, Jan. 13-Feb. 24, ended in an armistice which left each country, with minor adjustments, in possession of the areas it occupied on Jan. 24. Armistices followed with Transjordan, April 3; Lebanon, March 23; and Syria, July 20.

Meanwhile, a U.N. conciliation commission, set up Dec. 12, 1948, and consisting of representatives of the U.S.A., France, and Turkey, had, after a tour of the Arab countries, called together representatives of Israel, Egypt, Transjordan, the Lebanon, and Syria at Lausanne, April 27, 1949. Talks went on until June 25 without result. Two problems seemed insoluble. Something like a million Arabs had fled from Israeli-occupied Palestine, and much of the room they had left had been taken up by Jewish immigrants. Israel insisted that settlement of the refugee problem should be part of a general settlement; the Arab states insisted that the refugee problem must be settled before territorial negotiations could begin. The Jews insisted that Jerusalem must be within Israel, though their govt. favoured the internationalisation of the holy places under the U.N.

Discussions at Lausanne were resumed July 18-Sept. 15, 1949, and

on Aug. 3 Israel informed the conciliation commission that she was prepared to accept the return of 100,000 Arab refugees, including those separated from their families still in Israel, on condition that the Arab countries absorbed the remainder. In Dec. the U.N. voted \$54,900,000 for Palestine Arab refugees, and set up a special relief and works agency to handle the fund. The U.S. Foreign Aid Authorisation Act of 1950 allocated \$27,450,000 for relief of Palestine refugees.

The U.N. Palestine political committee, meeting in New York, began on Nov. 24 to consider the proposals of the conciliation commission for the internationalisation of Jerusalem. Both Israel and Jordan (each then in possession of part of the city) announced that they could not agree to this. Nevertheless, the general assembly of the U.N. in Dec. adopted a resolution (opposed by the U.K. and the U.S.A.) that Jerusalem and its environs should be administered by a permanent international regime under the aegis of the U.N. through the trusteeship council. A revised statute of Jerusalem, adopted by the U.N. general assembly April 4, 1950, proposed to apply internationalisation to the municipality of Jerusalem and an area surrounding it under a governor appointed by the trusteeship council for three years. Israel and Jordan again expressed opposition to internationalisation of anything except the holy places; while the countries of the Arab league, with Jordan abstaining, supported the U.N. proposal.

Passport. The chief British passport office moved to Clive House, Petty France, Westminster, S.W.1 on Jan. 27, 1951.

Patel, V. J. This Indian politician died Dec. 15, 1950.

Pentagon, THE. Name given to the h.q. of the defence administration of the U.S.A. It is situated on the Virginia bank of the Potomac R., 2 m. from the centre of Washington, D.C. Built 1941-43 at a cost of 4 million dollars to house the U.S. war dept. (including the air force), it also housed the naval administration from 1948. It is the world's largest office building, designed in the form of a pentagon, with four rows of buildings forming its sides, leaving a five-acre pentagonal court in the centre. The total extent of the perimeter is seven-eighths of a mile.

Persia. In 1949 the Iranian govt. reverted to the use of Persia as the name of their country in dealing with foreign countries.

Peterlee. This new town came officially into existence Sept. 24, 1950.

Philippine Islands. The capital of the Philippine Republic was formally transferred from Manila to Quezon City, July 17, 1948.

Poland. Boleslaw Bierut, chosen president of the Polish national council set up in occupied Poland in 1944 by the Poles in Moscow, remained provisional president of liberated Poland until he was formally elected president for seven years, Feb. 5, 1947, by the first post-war parliament at its opening meeting.

Nationalisation of all businesses employing more than 50 workers was decreed Jan. 3, 1946.

On Aug. 6, 1946, the Russians placed under Polish control the left as well as the right bank of the river Oder; they transferred the city and port of Stettin to Polish administration June 29, 1947. Some 2,000,000 Germans had fled in 1945 from the German territories placed under Polish occupation by the Potsdam agreement; another 2,300,000 were expelled during 1946-47, after which only 56,000 German civilians remained in the territories officially incorporated in the Polish republic by the Polish govt. Jan. 11, 1949. Polish-occupied E. Prussia was renamed Masuria in 1945; the lands between the Oder-Neisse rivers and the pre-war west frontier were in June, 1950, divided into the three provs. of Koszalin, Opole, and Zielona Gora. In the same month, the E. German govt. acknowledged the Oder-Neisse line as the frontier between Germany and Poland—a step strongly resented in W. Germany.

A purge of "right wing and nationalist elements" from the Communist party brought the expulsion in Sept., 1948, of Wladyslaw Gomulka (a vice-premier of the gov. formed in Feb., 1947) from his post of secretary-general of the party, in which he was replaced by President Bierut. Merging of the Communist and Socialist parties into the United Workers party followed in Dec. Eleven months later, Nov., 1949, Konstantin Rokossovsky (who had commanded the Russian army that failed to relieve Warsaw in 1944) was released from the Russian army for service with the Polish army. He took Polish citizenship, and was made minister of national defence and c.-in.-c. of the Polish forces, which he proceeded to reorganize on Russian lines.

Arrest of French citizens in Poland during 1949 on charges of spying, countered by arrests of Poles in France, culminated in July, 1950, in the recall of the Polish ambassador from France.

In Poland, as elsewhere in E. Europe, the Communist govt. set itself to undermine the authority of the R.C. church. R.C. printing presses were nationalised in June, 1949; a decree of Aug. 7 threatened with imprisonment anyone who attempted to act on the pope's pronouncement of July 13 warning R.C.s that they incurred excommunication if they supported Communism. The govt. took over

Caritas, a big church charity, in Jan., 1950, and in March confiscated all church estates of more than 250 acres. A month later, an agreement was made between the govt. and the bishops of Warsaw, Plock, and Lodz restricting the activities of the clergy to moral, spiritual, and ecclesiastical matters.

See also (in main text) Polish Resettlement Corps; U.N.R.R.A.

Preventive Detention. System of treatment of criminals with a long record of crime, in use in England and Wales. Under Section 21 of the Criminal Justice Act (1948) a court has the power to decide in the case of any offender, who by reason of his age and criminal record can be dealt with under the section, whether his prolonged imprisonment is expedient for the protection of society. The qualification for preventive detention under the Criminal Justice Act is much wider than the definition "habitual criminal" under the Prevention of Crime Act (1908).

The new system takes into account that the sentence in its nature is preventive rather than punitive, and that its purpose is to do whatever is possible to ensure that the offenders when released are both able and willing to lead an honest life. It is divided into three stages. In the first the prisoner is carefully studied to decide to what extent reformative influences are likely to be effectual and what forms of training will be most useful; in the second stage the treatment approximates to that of a prisoner serving the last portion of a long sentence, but with certain additional privileges; during the third period he receives vocational training in a skilled trade, if he is fit for it, under conditions as closely approximating to freedom as possible.

Freysing, KONRAD, COUNT. This German ecclesiastic died in Berlin, Dec. 21, 1950.

Promethium. In 1949 this name was officially given to one of the rare earth elements, previously called illinium (*q.v.* in main text). Symbol Pm, atomic no. 61.

Queen Alexandra's Royal Army Nursing Corps. In 1950 this corps adopted the titles of rank used in the other units of the army, e.g. brigadier (up to 1942 matron-in-chief, later senior controller); capt. (up to 1942 sister-in-charge, later junior commander).

Queuille, HENRI (b. 1884). French politician. Born at Neuvic d'Ussel, Corrèze, March 31, 1884, he studied medicine in Paris, and practised as a doctor in his native town. A Radical Socialist, he became deputy for Corrèze in 1914. He was minister of agriculture 1925-27, and again, after holding other offices, under Daladier 1938-40; in the Reynaud cabinet of 1940 he was minister of food.

In 1935 he was elected senator. After the defeat of France in 1940 he lived in retirement until 1943, when he escaped from the country to become a commissioner of state in de Gaulle's Algiers administration. Elected to the national assembly in 1946, he became premier in Sept., 1948, in a coalition of centre parties which lasted until Oct., 1949. In the succeeding govt. Queuille was vice-premier under Bidault, and in Feb., 1950, also took over the ministry of the interior. On Bidault's defeat, June 24, Queuille headed a govt. that lasted two days, and then, July 12, again became minister of the interior under René Pleven.

Quezon City. Capital of the Philippine republic. It lies 10 m. N.E. of Manila, on a site chosen by President Quezon in 1937. Originally called New Manila, it was renamed Quezon City in honour of the president after his death. It was still under construction when it was formally constituted the Philippine capital in 1948.

Ration and Rationing. Soap, rationed in the U.K. from Feb. 9, 1942, was freed from rationing Sept. 9, 1950.

Reith, 1st BARON. In 1950 he became chairman of the Colonial Development Corporation.

Renner, KARL. This Austrian statesman died Dec. 31, 1950.

Reykjavik. The first national theatre of Iceland was opened here, April 20, 1950.

Rocket Propulsion. After the Second Great War, as a result of the successful development of jet and turbo-jet engines, the rocket was rejected as a power source for orthodox aircraft. It was seriously considered as a prime mover for human travel only if astronaut navigation should ever become possible. On the other hand, elaborate programmes were inaugurated by the govts. of the U.K., the U.S.A., and Russia to develop the rocket as a long-range missile. All three countries built up research teams containing a large proportion of German rocket scientists, but for two or three years experiments were restricted to supplies of captured V2s or adaptations thereof.

About 1948, however, both the U.K. and the U.S.A. began building single and multiple-stage rocket missiles of their own design. Early in 1949 an American-built two-stage rocket, the upper component of which was named the W.A.C. Corporal, was fired from the White Sands proving ground, New Mexico, and reached an altitude of 250 m. The rocket carried automatic instruments to record its course and altitude, but it disintegrated from the intense heat generated during its descent.

Another American rocket, the Neptune, designed for firing from the deck of a warship, reached an

altitude of 230 m. at a speed of 5,500 m.p.h. This attained an altitude of 38 m. in 75 secs. after being launched, by which time its fuel supply of liquid oxygen and alcohol was exhausted and it coasted the remaining distance under its own impetus.

Neither of these rockets was a guided missile, and they were fired to test altitude, not range; the range of such a missile would be approximately four times the apex of the trajectory (maximum alt.).

Besides being developed for military purposes (*see* Guided Missile in N.V.), special high-altitude rockets are used for exploring the upper atmosphere. One of these rockets, the Aerobee, is 19 ft. long and 15 in. in diameter. It is powered by two motors: one, burning solid fuel, is jettisoned when the velocity reaches 1,000 ft. per sec.; the other, using liquid fuel, carries the rocket to an altitude of over 100 m. When the Aerobee reaches its maximum altitude, an explosive charge blows off the tail, causing the rocket to fall earthwards end-over-end at a velocity of 150 ft. per sec. It carries 250 lb. of scientific equipment to record details of pressure and temperature during ascent. A Geiger counter (*q.v.* in N.V.) is included to register cosmic radiation, and an electronic device to measure the strength of the earth's magnetic field. Information collected by the instruments is automatically transmitted to the ground by radio, or the instruments are fitted with parachutes and released when the rocket begins to descend.

Romanones, COUNT OF. This Spanish statesman died in Madrid, Sept. 11, 1950.

Roscommon. Co. of Eire. In 1947 the co. was given four members in the Dáil.

Royal Fusiliers. A regimental museum was established in 1950 in the dépôt at the Tower of London.

Russell, BERTRAND A. W. RUSSELL, 3RD EARL. He was awarded the 1950 Nobel prize for literature.

St. Gall. Canton of Switzerland. Pop. (1950) 308,483.

St. Laurent, LOUIS STEPHEN (b. 1882). Canadian statesman. A French-speaking Canadian, he practised as a barrister for many years before entering politics in 1942 as member for East Quebec. He served in two Liberal administrations, first as minister of justice, then (1947) as minister for external affairs; and on the announcement in 1948 of Mackenzie King's forthcoming retirement, St. Laurent was elected by a

large majority of the Liberal party to succeed as their leader and thereby to the premiership. He became premier in Nov., 1948, after being summoned to attend the conference of Commonwealth prime ministers in London in Oct. because of Mackenzie King's illness. In the general election of June, 1949, he led the Liberals to a sweeping victory. He again attended the Commonwealth prime ministers' conference in London, Jan., 1951.

Senanayake, DON STEPHEN (b. 1884). Ceylonese statesman. Born Oct. 20, 1884, he was educated at St. Thomas College, Mount Lavinia, Ceylon, and spent several years as a coconut and rubber planter before entering the political field. Elected to the legislative council in 1924, he remained a member until 1942, when he assumed the offices of leader of the state council and vice-chairman of the board of ministers. As minister of agriculture and lands, 1931-47, he was responsible for works of irrigation in northern Ceylon and for colonisation schemes for the peasants. In Sept., 1947, he became the first prime minister of Ceylon, attending the Commonwealth prime ministers' conferences in London, 1948, 1949, and 1951 and presiding over the Colombo conference of Commonwealth foreign ministers, 1950. Made a privy councillor, 1950, he was the first Ceylonese to be so appointed.

Shaw, GEORGE BERNARD. He fractured his thigh in a fall, Sept. 10, 1950, and died seven weeks later, Nov. 2, at his home at Ayot St. Lawrence, Herts.

Shearer, MOIRA (b. 1926). British dancer. Born at Dunfermline, Jan. 17, 1926, her full name being Moira Shearer King, she began to study dancing at the age of 10, and after a period at the Legat school passed into the Sadler's Wells school in 1938. She first appeared on the stage with the International Ballet, 1941, joining the Sadler's Wells company in 1942 and beginning to dance principal roles in 1944. Possessed of natural lightness and speed, she was a brilliant classical dancer in Swan Lake, The Sleeping Beauty, and Ondrejella, and was also successful in lighter parts in La Boutique Fantasque and Mlle. Angot. Her dancing and acting in the film *The Red Shoes* (1948) won her fame with a wide public in the U.K. and the U.S.A.

Sierra Leone. A new constitution was authorised 1950, to come into force in 1951. Under it the executive council consists of the governor and eight members (four ex-officio, and four unofficial appointed by the governor from the elected members of the legis-

lative council); and the legislative council of the governor and 28 members (seven official, two unofficial nominated, and 19 unofficial elected). A literacy test for membership of the legislative council was introduced.

Sikkim. A new treaty with India, Dec. 5, 1950, confirmed the position by which Sikkim was a protectorate of India with full internal autonomy.

Sinkiang. After the Communist victory in China in 1949, the local authorities adhered to Mao Tse-tung's regime, and in March, 1950, two 30-year agreements were signed between Russia and the Chinese Communist govt. for establishing two Sino-Soviet companies to exploit oil and non-ferrous minerals, including uranium, platinum, wolfram, chromium, molybdenum, gold, silver, and copper, in the province. Communications were to be improved by the construction of aerodromes and of a railway eastwards from Chuchak to Kansu province, and by extending the highway system.

Sligo. Co. of Eire. In 1947 Sligo, jointly with Leitrim, was given five members in the Dáil.

Snowy Mountains HYDRO-ELECTRIC AUTHORITY. *See* Australia in N.V.

South Africa. Chief object of the Nationalist govt. was enforcement of *apartheid* (separateness) for the different "racial" groups in the Union. The govt.'s policy involved abolition of native representation in parliament; disfranchisement of the Cape coloureds; separate schools and training for non-Europeans; confinement of tribalised natives within their own reserves, and encouragement of detribalised natives to return to the reserves; segregation of natives from coloureds, and of both from whites.

The Union of South Africa Act, 1909, laid it down that no change could be made in the parl. representation of natives and coloureds except by a two-thirds majority of all members of both houses in joint session. Malan insisted that the very small majority he could command was enough to carry the necessary legislation. In this he was opposed not only by Smuts and the United party, but also by his own minister of finance, N. C. Havenga, leader of the Afrikaner party, who said that he could not be a party to amendment of the so-called entrenched clauses by a simple majority. Havenga's opposition, however, lost its importance when the Nationalist Party's success in S.W. Africa gave Malan a majority of five over the United and Labour parties, without the help of the Afrikaners.

Steps taken towards the putting into effect of other aspects of *apartheid* included the introduction of coaches reserved for whites on the Cape suburban rlys.; banning



of military training for Africans, and the disbandment of the native military corps and the Cape corps; cessation of the training of Africans as artisans.

The dispute between South Africa and the U.N. over South-West Africa is described under South-West Africa in N.V. Another occasion of U.N. criticism of South Africa was the Union's treatment of its subjects of Indian stock. Indians were first brought into Natal during the 19th century as coolie labour for the sugar plantations. Admission of coolies was stopped in 1897; but those already in South Africa prospered and increased in numbers until in 1950 there were some 282,000 Union subjects of Indian origin. Restrictive legislation against them began with an act of 1908 forbidding them to acquire land in and near Johannesburg. This was not very strictly enforced, and a number of Indians occupied land in the restricted areas for trading. An act of 1939 reimposed full restriction in 1941, and was renewed for a further three years in 1943. Smuts's govt. in 1946 passed the Asiatic Land Tenure and Indian Representation Act; this defined areas in which Indians might acquire land, prohibited change of ownership of land elsewhere, except by consent of the minister of the interior, from or to persons of another racial group; and provided for the eventual representation of Indians in the Union parliament and the provincial council of Natal.

In the same year the govt. of India brought the position of Indians in South Africa before the U.N. general assembly, which passed a resolution condemning the Union govt. India banned trade with South Africa.

That part of the 1946 act providing for parl. representation of the Indians was repealed in 1948; and the Malan govt. announced its aim of repatriating all persons of Indian stock. In May, 1949, the U.N. general assembly recommended the holding of a round-table conference by India, Pakistan, and S. Africa. Preliminary talks in Cape Town, Feb. 6-12, 1950, proved abortive.

Many Africans also felt that they were exploited by Indian traders, and their antagonism found expression in riots, Jan. 13-15, 1949, in Durban. Fifty Indians and 87 Africans were killed; 32 Europeans, 541 Africans, and 603 Indians were injured; two factories, 652 stores, and 1,285 dwellings were damaged or destroyed. Some 25,000 Indians, and 5,000 Africans living in houses owned by Indians, took refuge in municipal emergency camps.

The S. African govt. stopped state assistance for immigrants at the end of 1948; during Jan., 1946-March, 1949, 70,000 immigrants from the U.K. entered the country.

The language census of 1946, pub. 1948, showed that 57 p.c. of the

whites spoke Afrikaans, 39 p.c. English; 61 p.c. had a knowledge of both languages (compared with 57 p.c. in 1936). Pop. (1950) 12,320,000, of whom 2,620,000 were European; 8,347,000 natives; 1,030,000 coloureds; 323,000 Asiatics.

Before attending the Commonwealth premiers conference in London, in April, 1949, Malan stated that so long as S. Africa enjoyed its present freedom there was no intention of leaving the Commonwealth. A demand made by him in 1949 for the transfer to the Union of the British protectorates of Bechuanaland, Basutoland, and Swaziland—a development envisaged by the Union Act of 1909—was answered by a British statement that no decision on this subject would be taken until the peoples of the areas, African and white, had had an opportunity to express their wishes. Malan, however, announced in 1950 his intention of resuming negotiations on this question which had been interrupted by the Second Great War.

Right of appeal to the privy council in London was abolished by S. Africa in an Act of April 25, 1950.

South-West Africa. In 1946 the S. African delegate to the U.N. general assembly stated that his govt., as provided in the U.N. charter, reserved its right to liberty of action in regard to its mandated territory of S.-W. Africa, and was consulting the wishes of the inhabitants. The legislative assembly of S.-W. Africa later voted unanimously for incorporation in the Union. The U.N., however, recommended that the territory should be placed under U.N. trusteeship.

In 1947 the S. African parl. adopted a motion to give S.-W. Africa representation in that body, although immediate incorporation was not intended. The govt. of Malan was at one with that of Smuts on this point. The S.-W. Africa Affairs (Amendment) Act, drafted after consultations with the leaders of the United and Nationalist parties in S.-W. Africa, and with representatives of the Africans, the coloureds, and the German community, was enacted by the Union, April 23, 1949. It provided that the inhabitants of European stock in the territory should elect six members to the Union house of assembly, and that four senators for S.-W. Africa (two elected by the Union parliament M.P.s and the S.-W. Africa legislative assembly; two nominated by the gov.-gen., one of whom was to represent the interests of the coloureds) should sit in the Union senate. The existing legislative assembly of 12 elected and eight nominated members was replaced by a legislative assembly of 18 members elected for five years; the existing advisory council by an executive committee, consisting of an administrator appointed for five years by the gov.-gen. and four

other members elected by the legislative assembly. These new bodies were empowered to deal with all matters not specifically reserved to Union control (e.g. police and civil aviation). The territory kept financial independence for the time being. The Union retained all powers of administration and legislation given under League of Nations mandate.

Existing tribal institutions were maintained for Africans; neither they nor the coloureds were to receive the franchise.

In July, 1949, the S. African govt. informed the U.N. that she would send no more reports on S.-W. Africa. In Dec., the U.N. general assembly decided to seek the opinion of the international court of justice. This, delivered July 11, 1950, was that S.-W. Africa remained under international mandate; that the provisions of the U.N. charter covering transfer of mandated territory to U.N. trusteeship applied to S.-W. Africa; that S. Africa needed U.N. consent to any change in the status of S.-W. Africa; but that the charter did not oblige S. Africa to place the territory under U.N. trusteeship. Malan repudiated the right of the U.N. to interfere, and on Aug. 30, 1950, elections held under the Act of 1949 returned six Nationalist members to the Union parliament, 15 Nationalist and three United party members to the new legislative assembly.

Spencer, STANLEY. British painter. His series of paintings representing the Resurrection of the Body, exhibited at the Royal Academy, 1950, was bought for the nation under the terms of the Chantry Bequest.

Stanley, OLIVER F. G. This British politician died Dec. 10, 1950.

Stephens, JAMES. This Irish poet died Dec. 26, 1950.

Stimson, HENRY LOUIS. This American lawyer and politician died in New York, Oct. 20, 1950.

Sukarno, AHMED (b. 1901). First president of the republic of Indonesia. Born at Surabaya, June 6, 1901, he was educated at Bandoeng technical high school and in 1927 helped to found the Indonesian National party. For many years a prominent figure in the nationalist movement, he was several times imprisoned by the Dutch, being in 1937 interned on the island of Flores and later in Sumatra. He returned to Java in 1942 during the Japanese occupation and after the surrender of the Japanese in Aug., 1945, he proclaimed the independence of the republic of Indonesia (Aug. 17), of which he became president. The ensuing four years of conflict between the Netherlands and the republic, culminating in the interment of Sukarno and his ministers on the island of Banka in Dec., 1948, were terminated on Nov. 19, 1949, when the charter of the trans-

fer of sovereignty and the provisional constitution of the United States of Indonesia were ratified at Jokjarkarta by the cabinet of the Indonesian republic. He was elected first president of the United States of Indonesia, Dec. 16, 1949. He continued as president after he had converted the U.S.I. to a unitary state, Aug. 14, 1950.

Swinton, Sir E. D. This British soldier pub. memoirs, *I Remember*, 1948. He died at Oxford Jan. 15, 1951.

Switzerland. The census of 1950 gave the pop. as 4,696,057.

Syria. On March 13, 1949, the army chief of staff, Husni Zaim, deposed the president and the prime minister, Khaled al-Azm, and set himself up as dictator. On Aug. 14, he and his prime minister, Mohsin Berazi, were arrested, tried, and shot by a group of army officers led by Col. Sami Hinnawi. A constituent assembly elected in Nov. chose Hashem Attasi Pasha president, Dec. 14; and on Dec. 19 Hinnawi was arrested, and later released and pensioned (he was assassinated by a cousin of Berazi, Oct. 30, 1950). Attasi retained office, and Khaled al-Azm formed a new coalition govt. Dec. 28, 1949. See also Palestine in N.V.

Tassigny, J. de Lattre de. This French soldier was appointed high commissioner and c.-in-c. in Indo-China, Dec., 1950.

Thyssen, August Fritz. This German industrialist died in Buenos Aires, Feb. 8, 1951.

Town and Country Planning, Ministry Of. The name of this ministry was changed to local govt. and planning, Jan., 1951.

Trenchard, H. M. Trenchard, Viscount. This British administrator was awarded the O.M., 1951.

Trinidad. W. Indian island. Under a new constitution promulgated in 1950, the executive council consisted of nine members—three *ex officio*, five elected by the legislative council, and one nominated; the legislative council of 26 members—three *ex officio*, five nominated, and 18 elected, presided over by a speaker appointed by the governor from outside the council. First elections to the new legislature were held Sept. 18, 1950.

Truculent, H.M.S. British submarine, which sank in the Thames estuary, Jan. 12, 1950, through collision with a Swedish steamer, *Divina*. Of the 79 men aboard, only 15 were saved. A court martial found the commanding officer of the submarine guilty of "negligently or by default hazarding his ship" and he was severely reprimanded. The *Truculent*, launched 1942, had a displacement of 1,090 tons.

True Case. Ronald True died in Broadmoor Jan. 7, 1951.

Truman, Harry Shippe. President Truman's message on the state of the union to the 81st con-

gress earned the title "fair deal"; it urged prompt action to provide adequate social security, a system of prepaid medical insurance, sufficient housing, and the fulfillment of the promise, embodied in the constitution, of equal rights and opportunities for all. In his inaugural speech, Jan. 20, 1949, he outlined four points for "peace and freedom"; (1) continued support of the U.N.; (2) continued efforts to increase world trade; (3) strengthening of all freedom-loving nations; (4) assistance to under-developed areas of the world to enable their inhabitants to overcome "hunger, misery, and despair," and reach a reasonable standard of life under democratic conditions. The last came to be referred to simply as "Point 4."

Two Puerto Ricans attempted to assassinate the president in Washington, Nov. 1, 1950.

See also in N.V., Atomic Bomb; Korea; United States of America.

United States of America, The. A bill to set up compulsory federal health insurance, introduced into the Senate in 1949, was shelved; but a Housing Act, signed by the president July 15, provided for the building at public expense of 810,000 homes to be let at low rents; a slum clearance programme to cost \$1,500,000,000; and loans for farm housing to a limit of \$262,500,000.

The U.S.A. signed the North Atlantic treaty in Washington April 4, 1949, ratifying it July 25. Mutual Defence Assistance Acts in 1949 and 1950 allotted \$1,000,000,000 for each of the fiscal years 1950 and 1951 to be spent in military aid for the other countries that were parties to the treaty; these same two acts provided also more than \$500,000,000 for military aid to non-Communist countries outside the treaty. First consignment of material for Europe was a cargo of fighters and bombers picked up by the French aircraft carrier *Dixmude* at Norfolk, Va., March 8, 1950.

An act of Aug. 10, 1949, provided for closer integration of the three armed services of the U.S.A. under the control of a new minister, the secretary of defence, at the head of a new dept. of defence.

The Foreign Aid Authorisation Act for the year July, 1950–June, 1951, included an allocation of \$35,000,000 to provide technical assistance to under-developed countries—the president's "Point 4" already taken up by the U.N., which on Nov. 16, 1949, approved a plan to spend on advisory services \$36,000,000 in the first year, \$50,000,000 in the second, and set up a technical assistance board to carry it out.

In the Korean war the U.S.A. were to the fore diplomatically and militarily. It was the U.S. delegate to the U.N. who at 3 a.m. on June 25, 1950, asked the sec.-general to

call an emergency meeting of the security council. The council met that same afternoon, and adopted by nine votes to nil (Yugoslavia abstaining and Russia being absent) a resolution calling for the immediate cessation of hostilities, the withdrawal of N. Korean forces to the 38th parallel, and the giving of every assistance to the U.N. by member states, who should refrain from aiding N. Korea. On the 27th Pres. Truman announced that he had ordered U.S. air and sea forces to support S. Korea and the U.S. 7th fleet to prevent any attack on Formosa. The initial and later reverses of the U.N. forces (chiefly American) in Korea led to a revival among certain groups of isolationism. But Truman himself remained steadfast in his support of the U.N., and was able to carry the majority of his countrymen with him. American casualties were heavy: by the end of the year, 7,000 dead, 7,000 missing, and 29,000 wounded.

The population of the continental United States at the census of April 1, 1950, was 150,697,361.

See also in N.V. European Recovery Programme; Korea; North Atlantic Treaty; Truman, H. S.

Vaud. Canton of Switzerland. Pop. (1950) 376,707.

Victoria. State of Australia. An American tender was accepted, by the govt. of Victoria, Aug. 22, 1950, for the building of a dam at Eildon to control the river Goulburn 60 m. N. of Melbourne. The dam, of 13,000,000 tons and costing A£11,360,000 (£9,088,000 sterling), to take five years to build, was intended to supply power and water to a large part of Victoria.

Walton, W. T. This British composer was knighted, 1951.

War Graves Commission, Imperial. In Dec., 1939, it was decided to adopt the same procedure for graves of the Second Great War as for those of the First. The first cemetery to be completed was the Canadian cemetery at Hautot-sur-Mer, near Dieppe, dedicated in Aug., 1949. The total number of dead to be commemorated, either by headstones or on memorials, was estimated (1950) to be at least 500,000. By March, 1949, 332,000 graves had been recorded, and registers of the dead were being compiled. Those who have no known grave will again be commemorated on memorials in the various theatres of war.

The countries containing the largest number of cemeteries are France, Belgium, and the Netherlands. The graves in Italy are in 49 cemeteries and those in Germany in 13. The biggest cemeteries of the N. African campaigns are at Alamein and Halfaya-Sollum, Egypt; Tobruk and Acroma, Libya; Medjez-el-Bab, Tunisia.

A supplemental charter of 1941 empowered the commission to compile a record of civilian subjects

of the crown who died by enemy action. Bound copies of the first lists, containing more than 65,000 names, were placed in Westminster Abbey.

War Memorial. In 1950 the Imperial War Graves Commission announced proposals for the commemoration of those members of H.M. forces killed in the Second Great War whose graves are unknown. The following is a summary:

R.N. memorials to be linked with First Great War memorials at Chatham, Plymouth, Portsmouth;

Royal Canadian and Royal New Zealand navies to have new memorials built in the two dominions;

Memorials to be built at Liverpool for men of the M.N. who served with the R.N.; at Lowestoft for the R. Naval Patrol Service; at Lee-on-Solent for the Fleet Air Arm;

Memorials to soldiers of the British Commonwealth to be "by campaigns," and wherever possible placed in a war cemetery. Sites in Europe selected at Trondhjem, Dunkirk, Bayeux, Groesbeek (near Nijmegen), Cassino, and Athens; in Africa, at Medjez-el-Bab, Alamein, Hargeisa, Port Sudan, Mombasa, Diego Suarez (Madagascar); in Asia, at Beirut, Singapore, Saiwan Bay (Hong Kong), and in Iraq and Persia. Sites still to be selected were for memorials for the Burma campaign, for India, and for soldiers who died at sea;

Air force memorials to be erected at Cooper's Hill, overlooking

Runnymede (for the U.K. and N.W. Europe); Malta (for central Mediterranean and W. Africa); Alamein (for Greece, Crete, the Middle East, W. Asia, and the rest of Africa); Singapore (for India, Burma, Malaya, and the Far East); and in Canada (for those who lost their lives while training in that country or in the U.S.A.).

White House, THE. Owing to its dangerous condition, President Truman had to leave the White House in 1949. In 1950-51 the whole interior was removed, foundations of reinforced concrete 20 ft. deep were made, and a new interior was installed.

Whittington. Parish of Derbyshire. At Whittington Heath near by, borings during 1948-49 reached good coal at 4,000 ft. Est. yield of the seams uncovered was a minimum of 400 million tons.

Wilson, HENRY MATTLAND WILSON, 1ST BARON. His book *Eight Years Overseas, 1939-47*, was pub. 1950.

Winant, JOHN G. American diplomatist. His book, *Our Great Harvest* (selected speeches), with intro. by Winston S. Churchill, was pub. 1950.

Woodcock, BRUCE (b. 1921). British boxer. Born at Doncaster, Yorks, Jan. 18, 1921, he was educated locally and obtained employment in the railway shops in that town. As an amateur he won the A.B.A. light-heavyweight championship in 1939, then turning professional in 1942, he became the heavyweight champion of

Great Britain and of the British Empire by knocking out Jack London in the 6th round at Tottenham, London, July 17, 1945. His victory over Al Renet (France), whom he knocked out in the 6th round at Manchester, July 29, 1946, brought him the European heavyweight title.

In 1947 he successfully defended his European title against Stephane Olek (France), winning on points over 15 rounds at Manchester, March 17, but lost to the American Joe Baksi on April 15, retiring in the 7th round. Other notable fights include his win on a disqualification against Lee Savold (U.S.), Dec. 6, 1948, and his defeat of Freddie Mills by a knockout in the 14th round, June 2, 1949. In a return bout with Lee Savold, at the White City, London, June 6, 1950, advertised as being for the world heavyweight championship, he retired at the end of the 4th round.

Yukawa, HIDEKI (b. 1907). Japanese physicist. Born at Tokyo, Jan. 23, 1907, son of a geologist, he was educated at Kyoto university, where in 1932 he became a lecturer, and in 1939 professor of physics. He forecast the existence of the meson (*q.v.* in main text), 1935. In 1948 he went to the U.S.A. to work on nuclear physics, and in 1949 was appointed visiting professor of physics at Columbia university. As an outstanding pioneer in theoretical physics he was awarded the 1949 Nobel prize for physics.

Zürich. Canton of Switzerland. Pop. (1950) 772,617.

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